

Regional Oral History Office
The Bancroft Library

University of California
Berkeley, California

University of California
Source of Community Leaders Series

Joel W. Hedgpeth

MARINE BIOLOGIST AND ENVIRONMENTALIST: PYCNOGONIDS, PROGRESS, AND PRESERVING
BAYS, SALMON, AND OTHER LIVING THINGS

With an Introduction by
John A. McGowan

Interviews Conducted by
Ann Lage
in 1992

Since 1954 the Regional Oral History Office has been interviewing leading participants in or well-placed witnesses to major events in the development of Northern California, the West, and the Nation. Oral history is a method of collecting historical information through tape-recorded interviews between a narrator with firsthand knowledge of historically significant events and a well-informed interviewer, with the goal of preserving substantive additions to the historical record. The tape recording is transcribed, lightly edited for continuity and clarity, and reviewed by the interviewee. The corrected manuscript is indexed, bound with photographs and illustrative materials, and placed in The Bancroft Library at the University of California, Berkeley, and in other research collections for scholarly use. Because it is primary material, oral history is not intended to present the final, verified, or complete narrative of events. It is a spoken account, offered by the interviewee in response to questioning, and as such it is reflective, partisan, deeply involved, and irreplaceable.

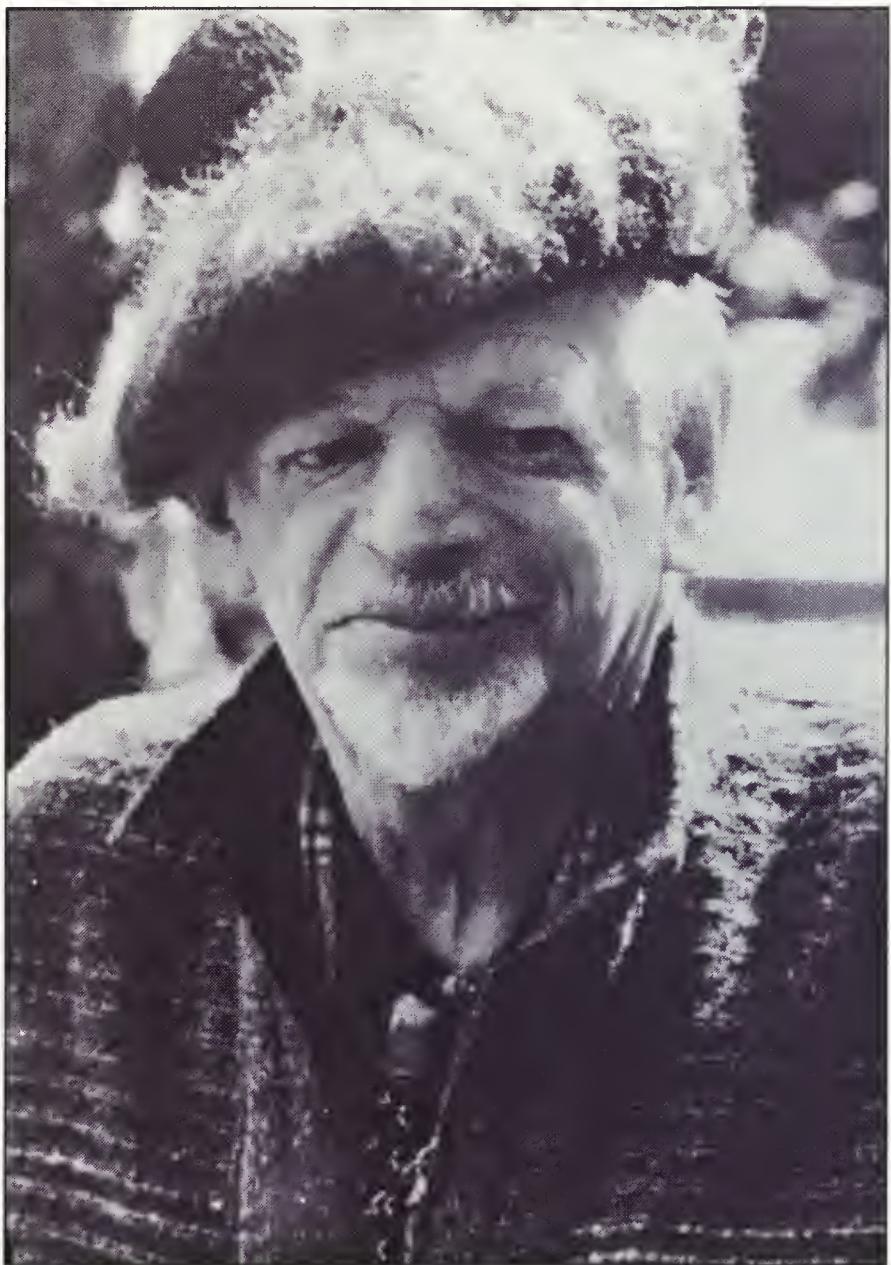
All uses of this manuscript are covered by a legal agreement between The Regents of the University of California and Joel W. Hedgpeth dated October 29, 1992. The manuscript is thereby made available for research purposes. All literary rights in the manuscript, including the right to publish, are reserved to The Bancroft Library of the University of California, Berkeley. No part of the manuscript may be quoted for publication without the written permission of the Director of The Bancroft Library of the University of California, Berkeley.

Requests for permission to quote for publication should be addressed to the Regional Oral History Office, 486 Library, University of California, Berkeley 94720, and should include identification of the specific passages to be quoted, anticipated use of the passages, and identification of the user. The legal agreement with Joel W. Hedgpeth requires that he be notified of the request and allowed thirty days in which to respond.

It is recommended that this oral history be cited as follows:

Joel W. Hedgpeth, "Marine Biologist and Environmentalist: Pycnogonids, Progress, and Preserving Bays, Salmon, and Other Living Things," an oral history conducted in 1992 by Ann Lage, Regional Oral History Office, The Bancroft Library, University of California, Berkeley, 1996.

Copy no. 1



Joel W. Hedgpeth, Salt Point, Sonoma County, 1984.

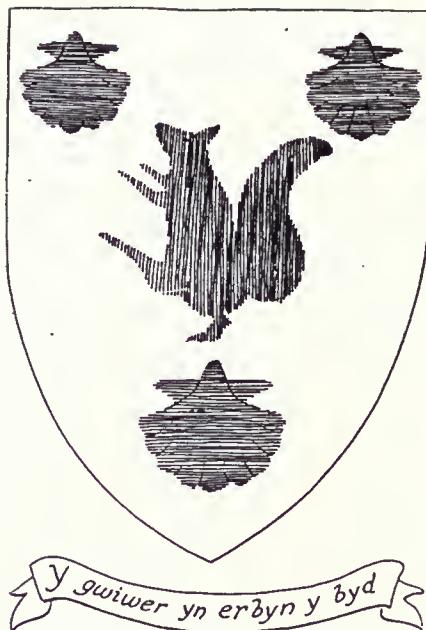
Photograph by Steven Obrebski

Who will tell me, what fair
goddess will lead ^{me} to the
right word?



Pwy ddysg im, pa dduwies gain,
Wir arraith i aruyrain?

My allegorical self portrait
Jled



The motto reads, "The squirrel against the world."
The original Welsh is "The truth against the world."

qwir--truth
qwiwer--squirrel

They sound very much alike.--JWH

Cataloging Information

Joel W. Hedgpeth (b. 1911)

Marine Biologist

Marine Biologist and Environmentalist: Pycnogonids, Progress, and Preserving Bays, Salmon, and Other Living Things, 1996, xiv, 329 pp.

Hedgpeth and McGraw family history; childhood in Oakland and the Sierra foothills; studies in biology at UC Berkeley, University of Texas; comments on Monterey Bay marine biologist Ed Ricketts, Steinbeck character and ecologist; founding the Society for the Prevention of Progress, revising Between Pacific Tides; Scripps Institution of Oceanography, 1950s; director, University of the Pacific's Pacific Marine Station, Dillon Beach, 1957-1965; discusses opposition to Pacific Gas & Electric Company's proposed nuclear power plant at Bodega Bay, CA, 1957-1964; director of Oregon State University's Marine Science Center, 1965-1973; pycnogonid (sea spider) research, lifelong and worldwide; research trips to Antarctica; estuarine studies; research and testifying on San Francisco Bay and Delta environmental issues.

Introduction by John A. McGowan, Scripps Institution of Oceanography.

Interviewed 1992 by Ann Lage for the University of California, Source of Community Leaders Series. Regional Oral History Office, The Bancroft Library, University of California, Berkeley.

ACKNOWLEDGMENTS

The Bancroft Library, on behalf of future researchers, wishes to thank the University of California Class of 1931 Oral History Endowment and the following persons and organizations whose contributions made possible this oral history of Joel W. Hedgpeth. Special thanks are owed Michael Herz, the Baykeeper project of the San Francisco Bay-Delta Preservation Association, William T. Davoren, and Irwin Haydock for their leadership in organizing the funding.

Foundations

San Francisco Foundation
Marin Community Foundation
David and Lucile Packard Foundation

Individuals

Carlo and Eleanor Anderson	Gordon Gunter
Bill Austin	Cadet Hand
Karl Banse	Irwin Haydock
Dick Barber	Alice Q. Howard
Mary Bergen	Douglas L. Inman
Charles P. Berolzheimer	Ray B. Krone
Jerry and Faith Bertrand	Kris Lindstrom
Harold Bissell	Wesley Marx
Michael Black	David T. Mason
Thomas E. Bowman	Mr. & Mrs. John A. McGowan
Margaret G. Bradbury	John L. Mohr
Gray Brechin	William A. Newman
Richard C. Brusca	Frederic H. Nichols
Ralph Buchsbaum	Larry C. Oglesby
James T. Carlton	Barry Paine
Lloyd Carter	David E. Pesonen
James S. Clegg	Joseph & Freda Reid
Peter and Carolyn Connors	Nancy J. Ricketts
L. Eugene Cronin	Michael Rozengurt
William T. Davoren	Virginia Scardigli
Paul K. Dayton	Doris Sloan
Douglas R. Diener	Mr. & Mrs. Felix E. Smith
Alyn C. Duxbury	Robert B. Spies
Evan C. Evans III	Edgar M. Tainton
Phyllis M. Faber	Margery & Fred Tarp
Daphne Fautin	Eleanor S. Uhlinger
Rimmon C. Fay	B.E. & Toni Volcani
Harold Gilliam	Craig J. Wilson

TABLE OF CONTENTS--Joel Hedgpeth

PREFACE	i
INTRODUCTION--by John A. McGowan	iii
INTERVIEW HISTORY	xi
BIOGRAPHICAL INFORMATION	xiv
I FAMILY HISTORY AND BOYHOOD INTERESTS	1
Mother's Family--the McGraws	1
Nellie Tichenor McGraw Hedgpeth--Joel's Mother	9
Joel Hedgpeth, Mountain Blacksmith	10
Some Early Memories and a Traumatic Injury	13
A Family of Aunts--Family Stories	16
Early Interest in the Natural World: Ants, Seashells, and Childhood Reading	22
Book Collecting, Book Critiquing, and Music	28
Boyhood Wanderings in the Sierra Foothills, 1920-1921	34
Father's Tenuous Tie to the IWW	42
Solitary Time in Nature	45
II FORMAL EDUCATION, ELEMENTARY SCHOOL THROUGH THE UNIVERSITY	47
Public Schools, Homes, and Family in Stockton and the Bay Area	47
Palo Alto Military Academy, 1922	56
Junior High and High School in Oakland	57
A Summer Idyll	61
San Mateo Junior College, 1929-1931	62
Studies at UC Berkeley, Class of 1933	65
English from George Stewart	67
Zoology Studies	70
Choosing Marine Biology, and Sea Spiders	71
Professors S. F. Light and Joseph Grinnell at Berkeley	77
The Controversial Professor Lund at the University of Texas	80
A Boyhood Interest in Shells and Sea Creatures	83
More on College Studies in Zoology and Biology	87
III ECOLOGICAL THINKING, ED RICKETTS, AND PROGRESS	90
The Concept of Ecological Communities in Marine Biology	90
Ed Ricketts, a Marine Biologist and Steinbeck Character	93
An Ecologist and Systematist	96
Revising <i>Between Pacific Tides</i>	97
Ethology: A Recent Development in Ecology	101
Ricketts and the Influence of <i>Between Pacific Tides</i>	104
"Philosophy on Cannery Row"--Ricketts, Steinbeck, Joseph Campbell	107
The Society for the Prevention of Progress	113
Various Articles and Papers Noted	117
Jinglebollix	120
Ed Ricketts' Innovative Work	122

IV	BEGINNING A CAREER AS A PROFESSIONAL BIOLOGIST	127
	An Introduction to Pycnogonid Studies	127
	Evolution of the Treatise on Marine Ecology and Paleoecology	131
	Research Biologist at Scripps Institution of Oceanography and Editor of the Big Red Book	135
	Cold War Concerns of Naval Intelligence at Scripps	137
	Responsibilities of Editing the Treatise on Marine Ecology	142
	Association with College of the Pacific	149
	More on Graduate Studies in Texas	151
V	DILLON BEACH AND BODEGA BAY, 1957-1965	156
	Director of the Pacific Marine Station at Dillon Beach	156
	Alden Noble	156
	Charles Berolzheimer's Contribution	158
	Classes and Oceanographic Studies at the Station	160
	National Science Foundation Program for Teachers	166
	Other Studies and Researchers in Tomales Bay	169
	Proposed Pacific Gas and Electric Company (PG&E) Nuclear Power Plant at Bodega Bay, 1957-1964	173
	Potential Hazards of a Nuclear Plant	176
	Public Involvement in the Controversy	178
	University of California's Involvement	181
	Opponents to the Power Plant	187
	More Citizen Activists	191
	Leaving Pacific Marine Station	194
VI	MARINE SCIENCE CENTER AT OREGON STATE UNIVERSITY, 1965-1973, PYCNOGONID RESEARCH, AND ANTARCTICA	196
	Program, People, and Problems at the Yaquina Biological Laboratory	196
	Working with Bill Fry at Dillon Beach on Pycnogonid Research	204
	A Research Program in Antarctica	207
	Some Interesting Characteristics of Sea Spiders	208
	Tourists at Palmer Station	213
	Studying the Impact of Scientific Activity on the Antarctic Environment	216
	Hedgpeth Heights	222
	More on Oregon State University	224
	"Steinbeck and the Sea" Conference	227
	Retirement	230
VII	ENVIRONMENTAL HEALTH ISSUES OF SAN FRANCISCO BAY AND DELTA	231
	Estuarine Studies	231
	An Encounter with the Archdruid	233
	Estuaries in Texas	235
	The Sea of Azov	236
	Research on San Francisco Bay--Geological Survey, UC, and Stanford	238
	Testimony Regarding Water Rights	243
	Conflict between Agribusiness and Environmentalists over Water Distribution	244
	Testifying for the Bay Institute, 1987-1990	247
	The Sea of Azov Comparison	248

Problems with Water Diversion in Russia Using Some Texas Estuarial Data	250 252
Measuring Water Conditions in the Bay	254
The Tule Hypothesis and the Oyster Shell Challenge	257
Striped Bass Population and the Flood of 1863	262
Outcome of the Bay-Delta Hearings	264
Testimony by Scientists on Public Policy Issues	265
Questions for Future Bay and Delta Research	269
The Roman versus Celtic View of Life	273
Recognition for Work to Save the Environment	274
 TAPE GUIDE	276
 APPENDICES	277
A. "A Boy's Life at Mather, 1921-1922" by Ted Wurm.	278
B. "Sea Spiders (Pycnogonida)", introduction to the proceedings of a meeting held in 1976 at the Linnean Society in honor of Joel Hedgpeth, and a listing of Hedgpeth entries in "A pycnogonid bibliography."	282
C. "Ed Ricketts, Marine Biologist" by Joel Hedgpeth, from the <u>Steinbeck Newsletter</u> , Fall 1995.	293
D. Letter from Aldo Leopold, 1947.	295
E. "Progress--The Flower of the Poppy," by Joel Hedgpeth, in <i>American Scientist</i> , vol. 35 (3) 1947.	296
F. <u>Treatise on Marine Ecology and Paleoecology</u> , 1957, Foreward and Contents.	300
G. Family placenames: Tichenor Rock, Nellie's Cove, Nellie Lake, Hedgpeth Heights.	302
H. Statement on San Francisco Bay-Delta Estuary--An Ecological System, 1969.	303
I. The Edward W. Browning Achievement Awards, 1976.	305
J. Curriculum Vitae of Joel W. Hedgpeth.	308
K. Commencement Speech to Class of 1970, Fresno State College	316
 INDEX	326

PREFACE

On the occasion of the 50th anniversary of our graduation from the University of California at Berkeley, the Class of 1931 made the decision to present its alma mater with an endowment for an oral history series to be titled "The University of California, Source of Community Leaders." The Class of 1931 Oral History Endowment provides a permanent source of funding for an ongoing series of interviews by the Regional Oral History Office of The Bancroft Library.

The commitment of the endowment is to carry out interviews with persons related to the University who have made outstanding contributions to the community, by which is meant the state or the nation, or to a particular field of endeavor. The memoirists, selected by a committee set up by the class, are to come from Cal alumni, faculty, and administrators. The men and women chosen will comprise an historic honor list in the rolls of the University.

To have the ability to make a major educational endowment is a privilege enjoyed by only a few individuals. Where a group joins together in a spirit of gratitude and admiration for their alma mater, dedicating their gift to one cause, they can affect the history of that institution greatly.

The oral histories illustrate the strength and skills the University of California has given to its sons and daughters, and the diversity of ways that they have passed those gifts on to the wider community. We envision a lengthening list of University-inspired community leaders whose accounts, preserved in this University of California, Source of Community Leaders Series, will serve to guide students and scholars in the decades to come.

Lois L. Swabel
President, Class of 1931

William H. Holabird
President, retired, Class of 1931

Harold Kay, M.D.,
Chairman, Class of 1931 Gift Committee

September 1993
Walnut Creek, California

UNIVERSITY OF CALIFORNIA
SOURCE OF COMMUNITY LEADERS SERIES

Robert Gordon Sproul Oral History Project. Two volumes, 1986.
Includes interviews with thirty-four persons who knew him well.

Bennett, Mary Woods, class of '31, A Career in Higher Education: Mills College 1935-1974, 1987.

Browne, Alan K., class of '31, "Mr. Municipal Bond": Bond Investment Management, Bank of America, 1929-1971, 1990.

Dettner, Anne DeGruchy Low-Beer, class of '26, A Woman's Place in Science and Public Affairs: 1932-1973, 1996.

Devlin, Marion, class of '31, Women's News Editor: Vallejo Times-Herald, 1931-1978, 1991.

Hassard, H. Howard, class of '31, The California Medical Association, Medical Insurance, and the Law, 1935-1992, 1993.

Hedgpeth, Joel W., class of '33, Marine Biologist and Environmentalist: Pycnogonids, Progress, and Preserving Bays, Salmon, and Other Living Things, 1996.

Heilbron, Louis H., class of '28, Most of a Century: Law and Public Service, 1930s to 1990s, 1995.

Kay, Harold, M.D., class of '31, A Berkeley Boy's Service to the Medical Community of Alameda County, 1935-1994, 1994.

Kraken, Adrian A., class of '31, A Law Professor's Career: Teaching, Private Practice, and Legislative Representative, 1934 to 1989, 1991.

Peterson, Rudolph A., class of '25, A Career in International Banking with the Bank of America, 1936-1970, and the United Nations Development Program, 1971-1975, 1994.

Stripp, Fred S., Jr., class of '32, University Debate Coach, Berkeley Civic Leader, and Pastor, 1990.

Trefethen, Eugene E., class of '30, Kaiser Industries administrator, in process.

INTRODUCTION--by John McGowan

I first met Joel Hedgpeth in the winter of 1951 when I was a beginning graduate student at Scripps Institution of Oceanography (SIO). I was very uncertain of his position at Scripps but soon discovered that here was a very interesting, knowledgeable, and accessible man whose outlook on biology and on many other topics appealed to me. Further, he was able to express these views brilliantly, wittily, and often. It took some time to discover that his role at SIO was "editing" Volume I of the great two part *Treatise on Marine Ecology and Paleoecology* to be published as Memoir 67 of the Geological Society of America. This Treatise became one of the great classics of marine ecology and paleoecology. Volume I alone has 1,296 pages. Joel wrote six of the chapters in this volume and they are among the best in this or any other book on this subject of the next two decades.

One reason it was difficult for us young students to understand just what he was doing was his habit of arriving at 5:00 a.m., working hard at editing for maybe five hours, then spending the rest of the day visiting various offices and laboratories around Scripps. Typically, Joel would arrive unannounced, with a great, long complicated story--which he began somewhere down the hall--about events and situations that were frequently obscure, but always amusing. Some time into these monologues, it might turn out to be about a dispute between eminent Victorian naturalists that took place some 90 years earlier. It took me some time to realize that these were not pointless recitals but rather his way of introducing important, fundamental questions that had cropped up during his early morning editorial work. Joel was very democratic about these excursions, everyone's office was fair game, and I suspect he used his visits to us students as sort of warm-ups for visits to the higher strata. This method of scientific interchange unfortunately did not go over well with some of the old mossbacks in white lab coats, especially since he had the habit of sitting on the corner of one's desk and sorting through the mail, interjecting parenthetical comments on it during the mostly one-way discourse.

It is perhaps not well known that in addition to the six chapters in the Treatise which are clearly his, he did heroic editing jobs (practically rewrites) of several others--so the term "editor" in this case involved considerably more than tinkering with, correcting, and arranging the work of others. The same is true of several editions of the equally famous textbook, *Between Pacific Tides*. But it is typical of Joel to be reticent about claiming credit where it is clearly due him.

In those days, even at Scripps, we were aware of the "Molecular Wars" chiefly through the efforts of the geneticist Adriano Buzzati Traverso (whom Joel persisted in calling transverso). Apparently Roger Revelle, the then director, had been convinced by Buzzati and others that the kind of "bug-counting" observational ecology we were doing was on its way out and

that "a revolution was needed in marine biology." As a reaction to this, we bug counters formed the Neo-Victorian Biological Society, an evening seminar group that included plenty of home brew. Joel was one of the founding members and in many ways its mentor.

Joel did manage to do some other writing while he was working on the Treatise. One effort was a lovely letter to the *La Jolla Light*, our local newspaper. He noticed that on the morning of certain days of the week there were large numbers of dead skunks on the streets of La Jolla; they had been hit by cars. He pointed out that not only was this very unseemly for patrician La Jolla, but that skunks were intrinsically valuable and beautiful. There followed a wonderful description of the sterling qualities of the skunk and a suggestion that everyone get up half an hour earlier on garbage days instead of setting out their cans the night before. Nothing came of this, of course. The letter was signed Jerome Tichenor, president (and sole member) of the Society for the Prevention of Progress. Many of us graduate students rushed to join the Society but were turned down; after all, additional members would have represented progress.

In 1954 a major, five-month expedition set out from Scripps for the North Pacific. One of the many purposes of the trip was to dredge the deep ocean with the newly invented Isaacs deep sea dredge. But the operation was run by an exceedingly timid technician more concerned about losing the dredge than exploration of the depths, so rather few hauls were made. There was a total of three successful dredge hauls, one of which caught a single pycnogonid. Joel wrote a paper on this result where the purpose was "...to discuss the interesting capture and its significance to science and the welfare of mankind." [See page 120a].

In this one-page report with a grandiose title, he compares the Scripps Expedition (Trans-Pac) results with the Swedish Deep Sea Expedition (fourteen months at sea) results by means of a "detailed statistical analysis." He points out that the Swedes caught only one pycnogonid as well, but out of nine deep dredges, so that number of "pycs" per haul for Sweden was 0.11 while SIO caught 0.33, and the Swedes' number per month was 0.07 while SIO's was 0.20. Therefore as can be seen from the table of the results, the SIO expedition was three times as successful both in terms of catch per unit of effort and per unit of gear.

"But the only justifiable conclusion, one that cannot offend any national sensibilities, is that the pycnogonid population of the world ocean has increased threefold since 1948. At this rate it is estimated that the pycnogonids may support a major fishery sometime in the next millennium." My reprint is signed "compliments of the author and statistician." A few years later a very serious professor of statistics at UCLA told her class that this paper was a serious misuse of statistical strong inference and null hypotheses testing, which, of course, was exactly Joel's point.

About the time his work on the *Treatise* was winding up, Scripps received a large grant from the Rockefeller Foundation, presumably to foment Revelle's "revolution" in marine biology. Buzzati-Traverso was in charge of a large symposium supported by this grant, one of the first with global representations. He sought Joel's help with the invitations. Joel wrote (in 1995) to me "I told him (Buzzati) also that the CIA had a ringer who would attend as a zoologist, although it was his fluency in Russian that they wanted him there because several Russian bigshots would be there (they never showed up). I knew also that the State Department was sending an official Russian speaker to tell them what it was all about. I told Buzzati that there would be both official and covert Russian speakers, but that we needed a Russian who was also a real zoologist, so he obligingly invited Gene Kozloff, and more Russian was spoken than if Zenkevich et al. (the invited Soviets) had appeared. The State Department's Russian was really someone from the East Side who knew Yiddish better than Russian, and one morning they let go comparing dirty words, and Dave (Joel's friend) apologized to Gene (Kozloff) who said he knew all those words, after all he was the son of a Czarist officer." This little story is rather typical of Joel for he not only remembered the darndest stuff (the above event took place around 1958) but he was a confirmed Russophile (also an Anglophile and a Germanophile) and delighted in deflating the pretentious (i.e. the CIA and State).

Part of the Rockefeller money allowed the appointment of some new research/faculty, and Joel had quite a clique recommending him. He also had written a very fine and detailed memorandum to the director on a "Proposed Program in Marine Biology." That is what he would propose to do at Scripps. In it are three specific suggestions: (a) the establishment of a course in invertebrate zoology, and as part of this course "there would be assigned ecological exercises which would serve to accumulate repeated observations" in the same place throughout the years; (b) expansion of the activities of the museum to include research and reference collections; and (c) a chair in the history of oceanography might suitably be included in the museum building.

He was particularly concerned about the matter of continuing observations: what we now know as time-series. What followed in the memo was a superb essay on the value and need of time-series. Without one bit of the statistical jargon which, in any event, he did not know or had not been invented yet, he clearly was talking about what we now know as frequency spectra, aliasing, correlation length scales, coherence and cross correlations. All this stuff is now on the verge of high fashion in marine biology.

He went on to point out what dire straits the field of taxonomy was in and that a proper museum at Scripps would include taxonomic work and a study collection for ecologists and physiologists. This sort of argument is now high fashion also; it's called diversity studies and is one of the darlings of the National Science Foundation. Anyone at Scripps today,

reading his words, would sincerely regret that none of this came to pass. Our science would have been greatly enhanced.

After the last manuscript had been sent in for the *Treatise* (Revelle's, of course), Joel informed Revelle that he had a comfortable offer from somewhere else, but Roger informed Joel that all had been arranged for him at SIO, budget, supplies, equipment, etc. Hadn't anyone told him? No, nobody had told him. When he was finally shown the budget he discovered that one of the "eminent" mossbacks had already spent \$5,000 of it. It was clear to Joel that he was to be part of someone else's department. The someone else in this case was well known to be arbitrary and self-important, characteristics that would not bode well for a productive, happy future for an unconstrained free thinker like Joel.

This was a great loss to Scripps Institution as subsequent events were to prove, for Joel went on to become a distinguished leader in the environmental movement, a prolific author in the history of West Coast marine science, a much sought-after consultant and lecturer, and a highly successful director of two important marine biology stations.

He was not bluffing Revelle when he told him of his other offer. He became director of the University of the Pacific's outstanding marine biology teaching and research laboratory, the Pacific Marine Station at Dillon Beach on Tomales Bay. Joel has said, "I think some of the best years of my life were spent at Dillon Beach." Certainly these were some of his most productive years, ones that firmly established him as one of the west coast's premier environmental scientists and a world reputation as a marine scientist. Many students look back on their experiences at Dillon Beach with great fondness for their time there and for their time with Joel. Many remember collecting specimens for class at 5:00 a.m. on the foggy, wet intertidal rocks, with Joel perched on one, serenading them with his Irish harp. Whether this happened more than once, I do not know, but it seems hundreds of former Dillon Beach students "remember" this. We all wish it happened to us.

Along with the teaching program, a first-class research effort was going on, particularly that of Ralph Johnson of the University of Chicago who was stimulated by Joel's great knowledge of natural history and invertebrate zoology. Some very fine community ecology of mud flats was done at this time.

But perhaps the most famous episode of these years was the Battle of Bodega Head. Bodega Head is a remarkable headland jutting out into the Pacific with Bodega and Tomales Bays to the south and a cold water, upwelling coast to the north. This was (and is) an ideal spot for a power generating plant from an engineering standpoint because of the availability of cooling water, so Pacific Gas and Electric began, apparently in the mid-1950s, to discuss acquisition with various state and county agencies and probably the University of California, Berkeley, who had plans for a marine laboratory on the head. None of this "gray labyrinth of maneuvering in the

back hallways of power" was made public and not until 1957 did Joel hear some vague allusions to it in a casual conversation at Berkeley.

Since Dillon Beach was very near Bodega Head and Joel has a great fondness for the local landscape, he tried to learn more and he did. PG&E did indeed plan to build a large nuclear-fueled power-generating plant on Bodega Head, and negotiations were well underway with no public announcement, let alone hearings, but with the full cognizance of the administration at UC Berkeley. The news broke in a local paper (Joel's secretary at Pacific Marine Station was a local correspondent). At that time Joel wrote the president of PG&E questioning the wisdom of siting a reactor near the San Andreas Fault. This turned out to be a very prescient question. He wrote many letters and recruited many allies to oppose this venture, but the iron-pants management of PG&E, the bureaucrats from the county, and the studied ambiguity of the UC Berkeley administration formed a solid phalanx of orthodoxy against which the nobodies of the opposition were supposed to shatter themselves.

This did not happen. Opposition, both well reasoned and semi-hysterical, grew and grew to PG&E and its plan. One inspired public relations stunt in 1963 engineered by Lu Watters, the great Dixieland jazz musician, was to release 1,000 balloons at Bodega Head, each with the message "This could be a radioactive molecule," to the jazz tune specially written for the occasion, "Blues over Bodega."

Joel wrote in the *Bulletin of Atomic Scientists*, March, 1965, "The battle was finally won on the basis of geological uncertainty," (a research vessel from Scripps Institution of Oceanography had done a seismic reflection study near Bodega Head and discovered a new complex of faults), "yet it [the battle] has become part of the growing movement in California to prevent the destruction of California as a livable environment by freeway builders, subdividers, and developers."

It is not clear to me which of the principles in this affair Joel was most angry with. He was certainly hurt by the attitude of the university for somewhere within the university administration there was a willingness to oblige outside interests. He has written "...it seemed to me at the outset that the university should serve the highest interest of the people of the state and that such interest should be above that of a mere gas and electric company no matter how large it was. It was this conviction that committed me to fight for Bodega Head." But sometime around 1963 or so, I asked him why he spent so much of his time and effort on the fight. As near as I can remember he said, "I just don't like the way those sons-o'-bitches do business." [See "The Battle of Bodega Head," p. 177a.]

Jerome Tichenor memorialized in 1965 the affair in a thin book of poetry, "Poems in Contempt of Progress," published under the auspices of the Society for the Prevention of Progress, by the Clandestine Press. On the last page is the colophon, "We regret to inform the reader that this book has been printed with the aid of electricity."

Of course he did many other things while fighting the Battle of Bodega Head. Teaching and running the highly successful marine station occupied much of this time, but as his fame grew he became a very popular lecturer on environmental issues, especially among the "don't trust anyone over thirty" crew. They saw immediately that this man was not about to pander to them nor indulge their many biases, but rather was one who had a great store of information in his head and the social and historical perspective to make sense of it. At the same time he was a frequently invited keynote speaker at national and international conferences and workshops.

He was so well connected with European scientists that most of them made a special effort to visit Pacific Marine Station to see Joel, and he was always a wonderful host to them. One special incident was his entertainment of a group of Soviet scientists and their political shadow. Joel crammed the group together in a small car for a trip up the coast to Fort Ross, the former Russian colony (now a park). The countryside was quite rural, but Joel kept up his usual rapid fire and erudite commentary on all manner of things--especially the not-very-interesting local history. In the middle of this monologue he said, "See that circular barn over there? A hired hand went mad there looking for a corner to piss in." How much of this the dignified and rather puritanical Russians got I do not know, but perhaps they missed it all together, for Joel's conversations were (and are) so full of parenthetical cracks that one tends to evolve a sort of low-pass filter.

I know little of Joel's spell as director of the Marine Science center at Oregon State University, but I have the suspicion that the administration who hired him thought they were getting a big Grant Swinger. In this they were surely disappointed, for although he surely could have played the right sort of footsy games with program managers in Washington (he'd seen enough of them to be an expert), this not only was not his style, but was repugnant to him, I am sure.

But it was during this time that a renewal of interest in John Steinbeck's early years was occurring among the literati. Joel had already written on the Steinbeck and Ed Ricketts collaboration on the book, *The Sea of Cortez*, and knew them both from his own early days on Cannery Row. His marvelous editing of several editions of *Between Pacific Tides* was also linked to those times. I believe it was then he began his historical research on Ed Ricketts' life and his late relationship with Steinbeck. This culminated years later (1978) with an extraordinary history of, chiefly, Ed Ricketts and his philosophical interweaving of ecology and society. The ecology, of course, was marine intertidal ecology. This history appeared as a two-volume set called *The Outer Shore*, and was published by the Mad River Press. I asked him why them, since it could have been Oxford or Chicago (but not Stanford). I got only a very ambiguous answer. My theory is that he liked their name--Mad River--further they did a very good job of printing it.

Once again there is much of Joel in these two volumes and the term "editor" does not fully describe his contribution. His introduction to Volume One is a pocket history of Monterey in the 1920s and 1930s and of the philosophical backdrop of marine ecology. This was very important in those days of the beginnings of experimental embryology (which relied chiefly on the eggs and larvae of marine organisms) and the "Organismal Conception"-- especially the study of colonial organisms such as ascidians. Part of Joel's fascination with Ricketts had to do with their shared fondness for poetry. These two volumes are history in the best sense of the word and are important contributions to our understanding of the development of marine science on the west coast of North America. Like most of Joel's publications, *The Outer Shore* will have a long intellectual and scientific half-life.

Surely one of his most famous papers is "Models and Muddles," (1977, *Helgolander wiss. Meeresunters*, 30, 92-104). Subtitled "some philosophical observations," it is often thought of as another Joel joke but it is anything but that. It is a sophisticated and witty dismemberment of mathematical ecosystem models. The practitioners of this field rank only slightly below molecular biologists in their messianic manner and their "I'm smarter than you are" tone. Joel could never resist deflating the pompous. He shows two box model diagrams of impossible complexity and a set of equations (all three from published sources) with so many parameters that no numerical "solutions" are remotely possible.

He goes on in two beautifully written pages to describe the work of Karl Moebius on the oyster banks of the North Sea, from which Moebius derived the concept of the biocoenosis...what we now call communities. He compares Moebius' descriptions to the amount of information it is possible to include in modern mathematical ecosystem models. But he does not damn models categorically, after all. Moebius had a conceptual and verbal model of oyster reefs which Joel suspects is quite incorrect or at least "to proceed upon them [Moebius' ideas] for the management of the oyster beds would have been unsuccessful." I think what generated this paper was Joel's experience with various workshops and public hearings on environmental matters. He says himself that this paper is a sequel to an earlier paper on "The Impact of Impact Studies." I'm sure he heard many models presented which were grossly oversimplified abstractions but which appealed to managers who needed "answers" and needed them quickly.

He says, "There is of course no inherent evil in attempting to simplify what we know or suspect of nature. . . . Unfortunately, however, many, and for the most part those not directly concerned with modeling activity, see in equations facts rather than ideas." This paper was reprinted in Russian and perhaps other languages. The question he raises is, what, after all, do we really know?

Joel in retirement has accomplished more than some do in entire academic careers, and he continues to be a much sought-after speaker and advisor. He continues to be an unusually alert environmental watchdog (and

advisor. He continues to be an unusually alert environmental watchdog (and attack dog). He still plays the harp, sings, and writes poetry. He still calls his friends around midnight with animated and zealous orations of events and persons they are only dimly aware of, but are soon made to understand.

So take a good look at Joel Hedgpeth everyone, for when he's gone there will never be another!

John A. McGowan
Professor, Marine Life Research Group
Scripps Institution of Oceanography

August, 1996
San Diego, California

INTERVIEW HISTORY

The Bancroft Library has an ongoing collection emphasis on the environmental history of California and the West, and its Regional Oral History Office since its founding in 1954 has interviewed major figures in the development of the environmental movement, forest and park policies, and California water issues. So we were very receptive and pleased in August of 1990 when we received a call from Michael Herz, then executive director of Baykeeper, the watchdog project of the San Francisco Bay-Delta Preservation Association. Mr. Herz urged us to undertake an oral history with Joel W. Hedgpeth, marine biologist and environmentalist. He knew Joel through their joint efforts to preserve the San Francisco Bay environment and knew from their many conversations that Joel's memory bank contained an irreplaceable record of coastal and estuarine scientific research, as well as memories of California history dating to his early childhood.

When we consulted with some of Joel's colleagues and collaborators for more information, he was described variously as "a character, irascible, bristling with opinions"; "widely educated, with an archivist's instincts, has a tremendous amount to say and will say it"; "a true Renaissance man--a respected marine biologist, a poet, an incisive commentator on the human condition, a raconteur of wonderful talents, friend to hundreds of people in the arts and in science who revere him."

David Pesonen, who led the citizen battle to defeat a PG&E nuclear power plant at Bodega Bay, spoke for Joel's environmental credentials: "Joel's trenchant correspondence, his enormous energy, his knowledge of many subjects, and his unflagging determination kept a flickering opposition alive [in Bodega Bay]. I am convinced that were it not for his determination there would be today a menacing nuclear power facility sitting on the San Andreas fault a few miles upwind from San Francisco."

It was clear that Joel Hedgpeth was an ideal candidate for an oral history memoir. Since all of our work is funded by outside gifts and grants, we turned to Mr. Herz for help. He was able to obtain initial support from the San Francisco Foundation and the Marin Community Foundation to enable us to begin research and interviewing. The UC Class of 1931 was happy to include the Joel Hedgpeth memoir in the University of California, Source of Community Leaders series funded in part by their endowment for the Regional Oral History Office. Additional funding came from more than sixty friends and admirers of Joel Hedgpeth, who responded generously to a request from Mr. Herz, William T. Davoren (founder and former director of the Bay Institute of San Francisco) and Irwin Haydock (a former student of Joel's at Pacific Marine Station). The David and Lucile Packard Foundation, through the efforts of Mr. Davoren, supplied the final gift that allowed us to complete the processing of the oral history.

Not surprisingly, given his interest in history, Mr. Hedgpeth responded positively to the idea of working with ROHO to produce an oral history memoir. At the age of eighty, he still was leading an active life, attending conferences, giving keynote addresses, editing papers, and no doubt keeping up a steady barrage of letters-to-the-editor on issues of concern. But he was willing to set aside time for the oral history project.

Preparation and planning for interviews included research in the papers Joel Hedgpeth had placed in the Bancroft Library, which consist largely of documentation of the Bodega Bay controversy; reading a variety of Hedgpeth publications on Ricketts, Steinbeck, and marine biology; perusing poems (written under his pseudonym Jerome Tichenor), letters-to-the-editor, hearing testimony, book reviews, and reports written by Joel; and conferring with Hedgpeth colleagues in his many enterprises.

We began interviewing in June 1992 at his home in Santa Rosa, California. In July he underwent open heart surgery, but bounced back quickly, and we resumed our interview schedule in September, with the seventh and final session (a total of fifteen recorded hours) on November 19, 1992. Joel's wife, Florence, was quietly present during many of the interview sessions and a supportive ally in the editing process, as well as an active figure in her own right. She was most often busy reading prodigiously to help select appropriate titles for her large and well-organized book club.

Taking Joel Hedgpeth from tape to type was challenging: his speaking style was idiosyncratic; the interviews were filled with allusions to people and works known only to Joel; his comments were sometimes elliptic; his progression not necessarily linear. The transcript, filled with more than the usual requests for clarification and elaboration, was sent for his review in June 1994. Joel's review of the transcript took some time; his schedule continued to be full. Finally, when we enlisted Mrs. Hedgpeth to encourage him, he set himself to the task. He went over the transcript carefully, responded to our queries, made a number of additions which are noted in brackets in the text, and returned the corrected transcript in March 1995. After we had entered his corrections and prepared the text in final format, he again read the entire oral history and made a few more additions and corrections.

Initial interview sessions dealt with Hedgpeth/Tichenor family history, with Joel commenting on photos and memorabilia in a family scrapbook. He described the roots of his interest in marine biology--the childhood books in his grandfather's study and the seashell collection of an Oakland neighbor. He had vivid memories of his childhood stay in 1920-1921 in the small town of Mather in the Sierra foothills, where he witnessed the building of the dam that flooded Hetch Hetchy Valley and where he incurred permanent injury to his hand while playing with a blasting cap. In a later unrecorded conversation Joel recalled that even at that early age he viewed the damming of the Yosemite National Park

valley as an act of destruction, and as he talked I had the impression that in some way the simultaneous injury to his hand was connected in his youthful mind to the environmental destruction he was witnessing. These correspondences might help explain his fierce lifelong opposition to environmental devastation.

Other discussions of his early life, complete with colorful anecdotes and characterizations, indicate landmarks in the development of Joel Hedgpeth, ecological thinker and founder of the Society for the Prevention of Progress. These influences include his education, both formal and informal, in grade school, junior college, at UC Berkeley, and the University of Texas; his youthful contact with Monterey Bay biologist Ed Ricketts and his later work revising and updating Ricketts' *Between Pacific Tides*; his field work in 1938-1940 on the Shasta Dam and its potential to destroy the salmon runs.

And, of course, the interviews covered the major epochs of his career as a marine biologist: editing and writing significant sections of the monumental *Treatise on Marine Ecology and Paleoecology* (known as the Big Red Book); directing the Pacific Marine Station at Dillon Beach and the Marine Science Center at Oregon State University; research far and wide on pycnogonids (sea spiders); and his contributions to estuarine studies, from Texas to Russia to the San Francisco Bay.

An interview with Joel Hedgpeth is bound to be accompanied by appendices, because he liberally refers to his many writings as he speaks and then produces copies of letters, reports, articles, poems, and illustrations from his copious files and the extensive library in his home office. Nine appendices are included in this volume, along with numerous illustrative pages inserted in the text. Additional supplementary papers have been placed in the Bancroft Library, where tapes of these interview sessions are also available.

When the oral history was nearing completion, Joel suggested that we ask John McGowan, professor of marine science at Scripps Institution of Oceanography, to write the introduction to this volume, and a felicitous suggestion it was. Professor McGowan has produced an introduction that not only captures Joel and his unique personality but makes very clear his contributions over more than fifty years to marine science and protection of the marine environment. This is especially important because our narrator was sufficiently reluctant to claim credit for his accomplishments that it is difficult to access his contributions from his own words alone. We thank Professor McGowan for his comprehensive introduction and recommend it as a first stop for readers of this volume.

Ann Lage
Interviewer

September 1996
Berkeley, California

Regional Oral History Office
Room 486 The Bancroft Library

University of California
Berkeley, California 94720

BIOGRAPHICAL INFORMATION

(Please write clearly. Use black ink.)

Your full name Joel Walker Hedgpeth

Date of birth September 29 1911 Birthplace 929 Chestnut St
OAKLAND CALIF

Father's full name Joel Hedgpeth

Occupation Blacksmith Birthplace Little Dry Creek
(Near Millerton, Fresno Co)

Mother's full name Nellie Tichenor McFar-~~Graw~~ Graw

Occupation Missionary (Presbyterian) Birthplace San Francisco

Your spouse Florence Mary Warrens

Occupation Teacher Birthplace nr. Cedarville, Modoc Co.

Your children Sarah Ellen Hedgpeth Boly

Warren Joel Hedgpeth

Where did you grow up? all around the Bay area; my father said he lived

Present community Santa Rosa CA. all around mt. Diablo

Education Ph.D.

Occupation(s) painter, clerk (Federal + State) field biologist

editor, poet, professor of Zoology & Oceanography Consultant

Areas of expertise invertebrate zoology - taxonomist (of Pycnogonida)

estuarine ecology. writing (including poetry - of a sort)

Served on NSF UNR + EPA panels (systematic + marine biology)

Other interests or activities singing (teror) accompany self

on Irish harp (clarsach) before aristocrat. book collecting

Celtic literature.

Organizations in which you are active Bio-systematists, life member

Estuarine Research Federation, Foreign Member British Society of
Lond. Fellow, Calif. Academy of Scientists.

I FAMILY HISTORY AND BOYHOOD INTERESTS

[Interview 1: June 25, 1992] ##¹

Mother's Family--the McGraws

Lage: As sort of a rationale for what we are doing, I want to read something I found that you had written. You wrote it in talking about Ed Ricketts, I guess. You said, "Boys do wander about the cities they live in. And the little events during such wanderings that may have had a large part in shaping their way of looking at the world are seldom remembered and even less often recorded for the benefit of those who come later." That's what I want to get at, the little things that shaped your way of looking at the world. I think some of that is your parents' experience too so maybe that can be in the back of our minds as we start up.

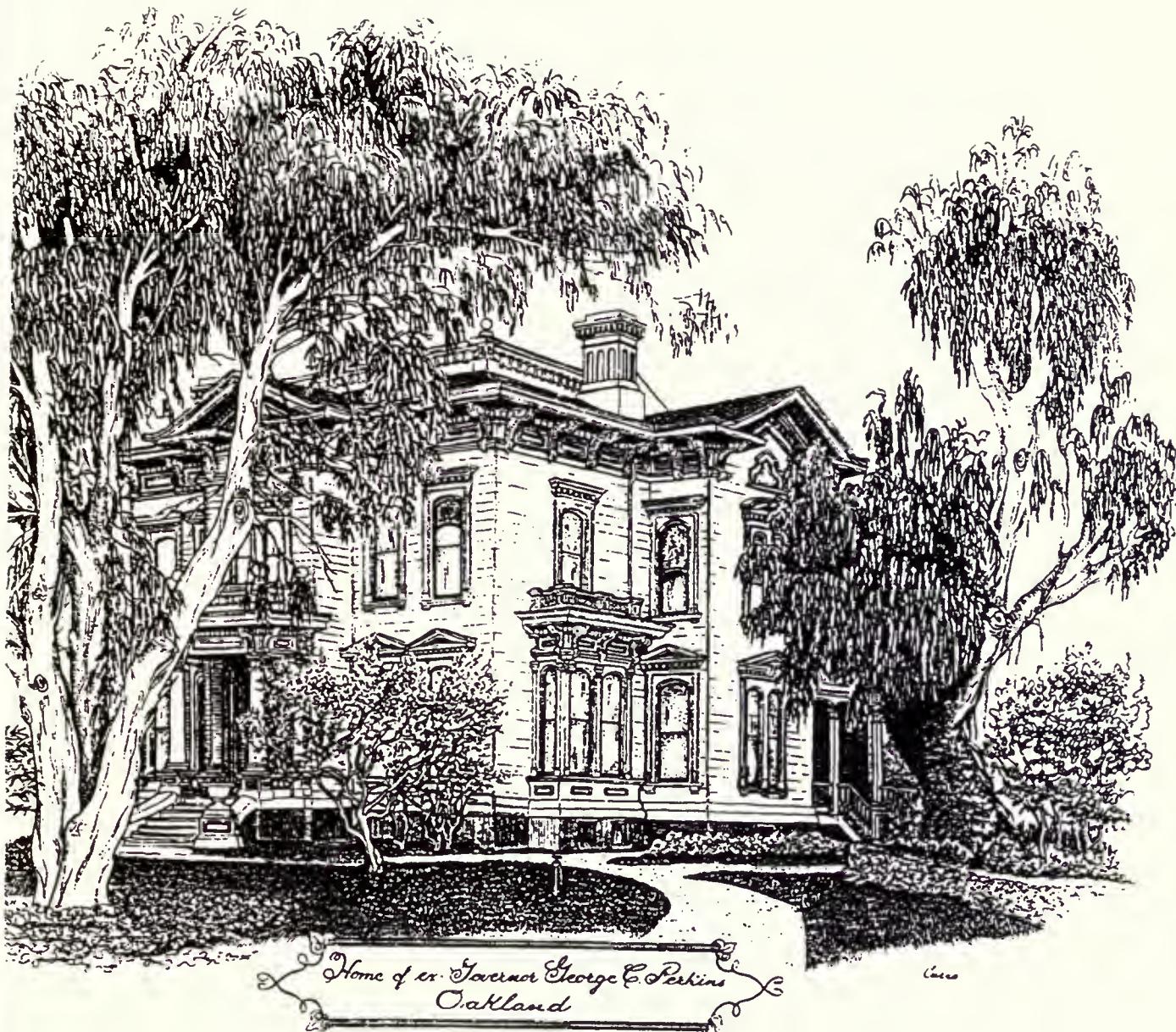
Hedgpeth: Yes.

Lage: Do you want to start telling about what you consider the most important in shaping you, in terms of your parents and their past?

Hedgpeth: There is a problem there. My parents weren't too well matched. They probably shouldn't have married. My father was a blacksmith, and he didn't belong to my mother's social class. He never really made enough money to support us, so he lived apart from us a great deal. He worked off in the ranches and small towns that needed blacksmiths.

About the time I got to college, he had a pretty good job rebuilding some of the very fancy ironwork on the big estates on the Peninsula because he was a master blacksmith. He had about

^{1##} This symbol indicates that a tape or tape segment has begun or ended. A guide to the tapes follows the transcript.



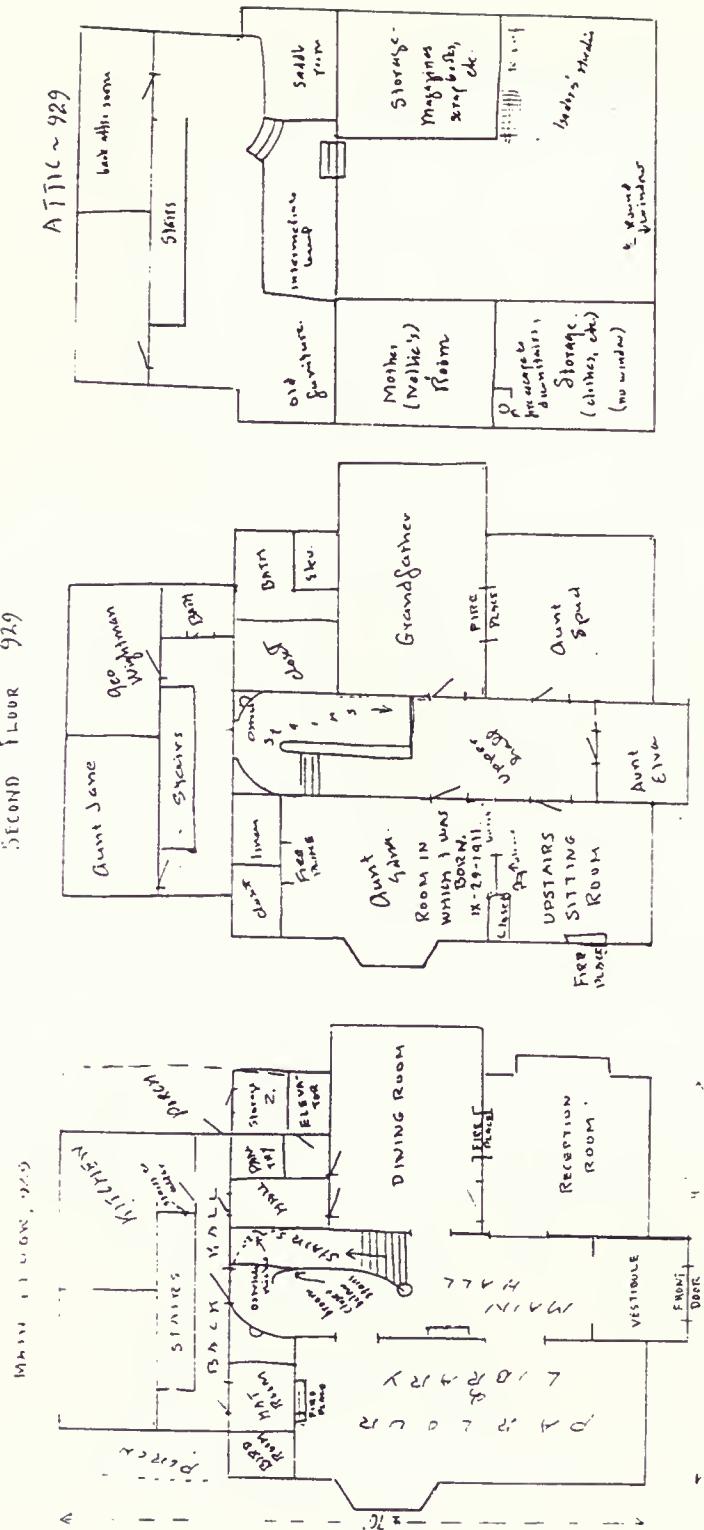
Home of ex. Senator George C. Perkins
Oakland

1a

Grandfather McGraw's Home

929 Chestnut Street, Oakland, California

1b



Floorplan. 929 Chestnut Street, Oakland, California.

a fifth-grade education but somewhere along the line he learned to read plans very well. You would just lay a diagram out for what you wanted and he would do it. So [he would be] reconstructing all those fancy iron gates which I suppose subsequently were taken down and sent in for bullets later on. A couple of them are maybe still around down there. So we really didn't have much family life until--.

Lage: So your father was away while you were living in Oakland?

Hedgpeth: Yes, or in other places. Well, we lived together when we were in Stockton.

Lage: Where were you born? Let's start with that, the most fundamental kind of question.

Hedgpeth: I was born [September 29, 1911] in a very large house. It had three floors. The third floor was really an attic but my mother's girlhood room was in a little room there under the eaves of that house. It was in Oakland, West Oakland. It was built by Dr. Cole, who was a dentist. Cole School in West Oakland is named for him, of course; that was in the neighborhood. I went there for a period. Then the house was purchased by Governor Perkins, who lived there several years. Then my grandfather bought it in 1889 and moved his family from San Francisco.

Lage: Do you know why he moved from San Francisco to Oakland?

Hedgpeth: Not really, except that I think the climate was considered better, though the house my mother was born in in San Francisco is still standing on 21st Street between Valencia and Guerrero. The fire stopped at 20th Street. They say the climate is better in the Mission. It's sunny in the Mission, they used to say.

For one thing, the family was simply too large for the house. A total of thirteen children were born, and nine or ten survived into adulthood. My mother was the fourth born.

Lage: She was Nellie?

Hedgpeth: She was Nellie. She was named for her mother who was called Nellie, though her given name was Sarah Ellen. But apparently Nellie was a fairly common version of Ellen in those days. The first daughter, the first girl, was named Ellen Isadore. Sarah Ellen was the youngest girl in southern Oregon in 1850. She was brought over from Ohio, I think by way of ship, and then crossed the Isthmus [of Panama] rather than in a wagon across the plains.

Lage: So the family didn't stop at San Francisco. They went on up to Oregon.

Hedgpeth: The other way around. They probably stopped over briefly at San Francisco. My great-grandfather William Tichenor was a coastal sailing master who founded the town of Port Orford, Oregon in 1850-51. Then my grandfather met my grandmother, apparently as part of his legal business. He was the first city attorney for Portland, Oregon. He got his law degree in about 1859 or 1860 and he came to Portland. At that time there was hardly anybody in that town. Portland until our time was considered a suburb of San Francisco.

Lage: What was the attraction of Portland for your grandfather?

Hedgpeth: Well, he thought there might be a future there because there wasn't anything around. Everything was up for grabs, I guess, including a law practice. He apparently had a very good knowledge of law. I still have one of his law notebooks; he went to the Albany School of Law in New York after graduating from Michigan. He met my grandmother in Port Orford, Oregon. Then he moved on to San Francisco; it was about 1867, I think. Edward Walker McGraw and Sarah Ellen Tichenor were married at Port Orford, Oregon, on June 4, 1869.

All the children were born in San Francisco or Oakland. They came over to a hospital or something on the Oakland side. What did I do with that darn book? It will tell us. Here, the Walker book. This was my grandmother's personal copy. She entered all the family one by one. My mother carried it on, so I've carried it on too, only I don't have the one from my last cousin who died a few years ago now. So we have them all listed here exactly as they arrived, except for one slightly amusing note. My mother put down the wrong year of the marriage of one of her sisters, making one of my cousins look illegitimate. [laughter] We had a laugh over that one.

My mother, Nellie Tichenor McGraw, was the fourth girl, then fifth was Susie Lois--Sue. She was the tomboy of the family. Then a boy finally occurs, Edward Walker McGraw, Jr., San Francisco, January 31, 1877. And Aldyth McGraw.

Lage: The boy didn't live long.

Hedgpeth: 1877, January, 31, to February. No, he did live just over a year. I was often told that he died of lead poisoning from poor plumbing. That always kept me from drinking water from bathroom taps.

Lage: But none of the rest of the children were affected?

Hedgpeth: No. So I don't know what it was. Probably just a convenient diagnosis in those days. So we go down through Aldyth. She died of exposure. She was about four years old. My grandfather laid her out on the marble-topped table and couldn't bear to see her go for several days. She was apparently a beautiful little girl.

Then Aunt Elva Brinkerhoff McGraw; that is another old family line from New York State that comes in. You know the old ferry Brinkerhoff? They are mainly in New Jersey.

We go right on down the line. Hazel, born in San Francisco, July 1882. Rena Geraldine--I think she was named after some character in a popular novel at the time, Geraldine. I've seldom seen the name Rena. The first name she never used.

Lage: Those aren't traditional names of the time, it doesn't seem.

Hedgpeth: I think this was, as I say, a novel of some sort. At least I was given to understand that. We all called her Spud. Why, I don't know.

Lage: Was she another tomboy?

Hedgpeth: No. She was the beauty of the family, as a matter of fact. She was born in 1884. Then Alexander Tichenor. He didn't live very long either. There was a problem with the boys. Two of them died. The last born child was a boy.

Lage: Was this Frederick here?

Hedgpeth: Yes. Frederick. He was killed in an automobile accident in 1930.

Lage: But he survived into adulthood.

Hedgpeth: My grandmother became ill before all the children were born, from rheumatoid arthritis we think. So Isadore raised most of the younger children. She was the little mother of the family. When she died in '94 or so, it was very sad.

Lage: Was that traditional that the grandchildren were born there in Oakland at the family home?

Hedgpeth: No. You see, Aunt Edith was having trouble. The Bigelow she married, he ran off with another woman or something. He said she wasn't exciting enough, so she got divorced, and she came to

live in the big house. I don't know why my Aunt Sue did. I guess she just came home to give birth because it was near a doctor. They lived out in Moraga then. That family owned what is now the big reservoir there in Moraga, the one that extends from Moraga down to near Richmond.

Lage: The San Pablo Reservoir?

Hedgpeth: Yes. They were sworn to deep, dark secrecy what they had been paid. They owned the key property in the middle of the valley that had to be had if you were going to have it at all. So they lived off of that the rest of their lives. The Rowlands were pretty sharp.

Lage: Was your family of some means?

Hedgpeth: My grandfather was a very successful attorney. I only have two items of my grandfather's professional practice. Of course, they lost so much in 1906. He was completely burned out then. That [indicates document] is probably one of the dullest things ever written. I can't get anywhere with it.

Lage: This is a petition of the San Marino Company and a brief in support of said petition in the Supreme Court of the United States in 1918.

Hedgpeth: I don't know if he had any other cases before the court there or not. Anyway, that's all I have. I don't know about always, but sometimes he would read *Alice in Wonderland* before going into court. It put him in the right mood for what was coming up, I guess. [laughter]

Lage: He must have had a good sense of humor. Do you remember him?

Hedgpeth: I remember him pretty well. He was going blind. He would come home in the evenings. He would commute to San Francisco. We lived on Chestnut. That part of Chestnut no longer exists; that's the middle of the Acorn redevelopment thing. So they tore all those big houses down and built that pseudo something or another.

So anyway, that's the kind of family my mother came from. I have pictures here of the whole lot of them.

Lage: Was that your mother who put this scrapbook together?

Hedgpeth: No, I did this.

[Mrs. Hedgpeth enters and comments]

Mrs. H.: His grandfather was an authority on maritime law and Spanish land grants. He was a famous attorney. He sent his underlings to most of the hearings but when it was a big one, he would hop on a train to wherever. But at that time Spanish land grants were being contested and marine rights. So many ships had been abandoned in San Francisco Bay. He had a famous lawyer-grandfather who practiced--.

Lage: He's not giving me a straight story?

Mrs. H.: I'm going to stand here and cue you. [laughter]

Hedgpeth: That's all right.

Mrs. H.: For fifty years he practiced on Pine Street. He was known far and wide as Judge McGraw. He had this huge house [at 929 Chestnut in Oakland], twenty-one rooms. He had installed an elevator for his invalid wife, and these ten girls grew up, you see, in it, what he bought.

Lage: There we go. Look at those pictures of those girls. That's wonderful.

Hedgpeth: This is the one that I never knew. That was Isadore. She died; maybe from TB or maybe something else.

Mrs. H.: She was twenty-nine and she had something in the bowels that bothered her. She dined out at restaurants and they gave pork and eggs. But they said later that now all they have to do is open it up and let the air hit it and it cures them.

Lage: She is the one who had raised the younger ones.

Hedgpeth: This is my mother. My mother had copper red hair. These were strawberry blond types.

Lage: So this is the house?

Hedgpeth: Yes.

Lage: That was a big festive place.

Hedgpeth: This is Spud in her young days. So she really was--.

Lage: Very pretty.

Hedgpeth: Her problem was that my grandfather never brought any young men home for dinner. He built a fourteen-foot fence to keep them

all in when they were young and skittish. So they just didn't meet very many men.

Lage: Did most of them not marry?

Hedgpeth: Yes, four of them married out of all of these girls.

Lage: Their father didn't go about trying to find them good matches?

Hedgpeth: No, and of course he met all the best men in town. The curious thing though, the F-2 generation--this is F-1 of course in the genealogical slang--out of these four marriages there were six children. My father had a single sister and I have the same number of first cousins, all from one marriage. Six. My Aunt Carrie, my father's sister, had six children. Four of my mother's side had a total of six. So the population hasn't really grown, you see. It's shrunk a bit. Our share of it anyway.

Lage: Very interesting. Now tell me about your mother's going into missionary work. Was that something her father encouraged or allowed?

Hedgpeth: Well, I think by that time--it was the 1890s of course--she was heading on into her twenties I presume. She was twenty years old when he gave her that big book on China. She was a very devout member of the First Presbyterian Church in Oakland. It was the largest church in northern California.

Lage: You mean the actual, physical--?

Hedgpeth: In members of the congregation. She got inspired by one of her teachers there, Julia Fraser, the owner of that fancy chair which she finally claimed--. When these ladies get old, they start promising things to everybody. Sometimes they forget and promise something to somebody else at the same time, then the inevitable bickering comes from that.

Lage: So you had a chair that she later reclaimed?

Hedgpeth: No, what happened was that my mother decided that she had better hurry up before dear Julia lost her mind and gave it away to somebody else. So she went over there with my aunt in her car and persuaded her that she might as well give it up now since she was hardly ever using it anyway. I don't know why my mother wanted that particular chair. It's a very nice chair. It's down in the other room here. You see, all this furniture in here came from the old house. Not all of it, not the coffee

table. The chairs and that great, big, overstuffed thing are modern.

So anyway, this is the way the family name ended.

Lage: You're saying that with the death of your uncle--.

Hedgpeth: Yes. You see, he had no children. So that branch of my [grand]father's family ended with him, that is, the name. On the other hand, my [grand]father's brother Theodore lived in Grosse Pointe, and there is still a Theodore McGraw there.

The old Alexander, my great-grandfather, made a great pile of money. I think he outfitted shoes and boots for a good part of the Union Army or something like that to make all that kind of money. He was a manufacturer of shoes.

##

Hedgpeth: We have all these family records from the McGraw side. They were stuffed in a lap desk.

Lage: When you were a little boy, did this kind of thing interest you?

Hedgpeth: I got interested right then and there not so much in what was in the letters but--. It was a coolish night. My Aunt Jane had appeared on the scene with this box. She opened it up and started to pull these papers out one by one and was starting to throw them in the fireplace. Evidently my grandfather brought the box over from his law offices.

Somebody said, "What are you doing there?" I don't remember which of my several aunts were around there at the time. My mother was there. They started picking them up and looking them over. They said, "Look here, this is a letter dated 1837. It's our grandfather's proposal of marriage to our grandmother." They found the reply too. Fortunately nothing particularly serious had burned. There was a very nice letter offering my great-grandmother her first job as a teacher in upstate New York. She got \$136 for the year plus living privileges with the chairman of the school board. Of course, I gather that in those days, if the chairman of the school board had eligible young sons, that was a fringe benefit not to be scorned. [laughter]

Lage: What happened to these letters? Where are these letters now?

Hedgpeth: I've got some of them. Those letters which were specifically referring to matters of the University of Michigan, I sent to

the Michigan people, because two of my great-grandmother's brothers were regents of the University of Michigan. The letter that started me off on that years later when I was looking them over said, "President Tappan (the guy who was president of the University of Michigan at the time) visited me yesterday. I gave him \$100 for a new telescope for the university and a pair of boots for himself." I sent that back to the archivist and said, "You ought to hang this up in a frame as an early example of fringe benefits."

Nellie Tichenor McGraw Hedgpeth--Joel's Mother¹

Hedgpeth: Anyway, my mother was the saving one. I think it had something to do with the fact that she had gotten burned out when she had been teaching missionary school in North Fork, California. Then she was asked to go on speaking tours; she left a lot of her notes and a lot of her books with some friends who stored them in a cabin, and it burned down. She always lamented that loss. She was kind of conditioned.

Lage: So when she became a teacher, basically, was it? Or a missionary.

Hedgpeth: Right. She was teaching missionary school.

Lage: Did she travel in northern California then?

Hedgpeth: No. She was based first in the Hoopa Valley, the Hupa Indians there. Before that, she had gotten interested in taking pictures in a very casual way. So she had a big box Brownie to start with.

Lage: Wonderful. Did she do her own developing?

Hedgpeth: Yes, she did. There were a couple of notes in some of her journals that survived, indicating that.

I had quite a few of these pictures here. There's some kind of a picnic going on, obviously. I sent them to Anne [Hus]

¹See Nellie McGraw Hedgpeth, *My Early Days in San Francisco* (San Francisco: Victorian Alliance, 1974) and Nellie Hedgpeth papers, San Francisco Theological Seminary Library. Also published in two installments in *Pacific Historian*.

Lage: Did Anne Brower know your mother?

Hedgpeth: Her mother and my mother were very good friends. Her mother is also named Anne. Her maiden name is Hus. As we were waiting in the rain for Clem Miller's funeral, she said, "You don't know who I am." I said, "I'm afraid I don't." "Does the name Anne Hus mean anything to you?" I said, "I have heard that name fairly often." That's the way she introduced herself.

Lage: These are your mother's pictures of her missionary days?

Hedgpeth: These were taken in North Fork. My mother had some very dear friends she made in North Fork she never gave up all her life. I stayed with them one time or another, a thing I don't remember at all. It's funny about memories because every time I would see one of the girls, the one nearest my age, a few months younger, she would point at me and say, "Frogs." Apparently, when we were about four years old, I had dropped frogs down her dress. [chuckling]

Lage: She didn't forget.

Hedgpeth: She didn't but I did completely. I don't know why.

Lage: I can understand that it would be more vivid to her.

Hedgpeth: I suppose, but there were a whole lot of other things. Even being there, I have no clear memory except of eating a lot of olives one time. I guess I ate a whole small barrel of olives in the course of our stay there.

Lage: These are pictures of the Indians.

Hedgpeth: There were just a few selections I put in here [the photo album]. The negatives of all the Indian places are on file in the Phoebe Hearst Museum of Anthropology.

Joel Hedgpeth, Mountain Blacksmith

Lage: Now we're coming to you. How did your parents meet? Did your mother meet your father out in this country?

Hedgpeth: Yes, he was in North Fork. He had a blacksmith shop there.

Lage: It does seem like an unlikely match now that you have described your mother's background.

Hedgpeth: Yes, it was. Of course, these were hill people really, Methodists.

Lage: This is your father's family?

Hedgpeth: Yes.

Lage: So they were not urban or educated?

Hedgpeth: They were all pretty well educated one way or another. Of course, most of them were men of the Book. Four of my father's uncles were ministers.

Lage: I see.

Hedgpeth: And cousins. Lewis, the one who settled in Arizona, apparently founded the Methodist Church in Phoenix, Arizona. There is a place called Hedgpeth Hills near Phoenix. I saw a picture of it in an engineer's display down at the Bay model, of all places, a while back.

Lage: Hedgpeth Hill at the Bay Model?

Hedgpeth: Well, they had a picture of something they were doing in the middle of Arizona. They had a series of big posters of their projects all over the western district, which included Arizona.

Lage: So your father was in a family of parsons but he didn't take up the call?

Hedgpeth: I had a copy of a letter was sent to me from Sheridan, Wyoming, out of the blue. I didn't know my great-uncle Thomas Riley who was one of the senior members of the family. He was writing to my grandfather and saying, "I'm getting on. Barely enough strength to chop enough wood for breakfast. Praise be to God I can preach as loud and as long as I ever could." [laughter] They were circuit riders of course, most of them. One of them got burned out in the troubles in Missouri in 1859, I think it was. I always thought that was why they came West. They packed up in 1858, manumitted their slaves and came across the plains.

Lage: Where did they settle? Or did they settle?

Hedgpeth: They settled in the valley around first, I think, Visalia, then up in Millerton. Then my grandfather moved up to the high lands a bit, to North Fork, to get out of the malaria. You may know that malaria was endemic in the Central Valley until fairly recently. So it was a very different group of people, yes.

Lage: Did the Methodists and Presbyterians fit well together or did that present any problems?

Hedgpeth: I don't think there was any quarrel about that.

Lage: Not that much doctrinal difference?

Hedgpeth: I think some quarrel arose somewhere along the line when my father and I argued over who was going to bless the food, so finally my parents decided to give that up rather than struggle with me. [laughter]

Lage: When your parents married, did they live in North Fork?

Hedgpeth: They went back to North Fork first. They weren't making enough in the winter time so they had to move on out. A number of places I have been told that I've been to but I have no memory of, like Purissima down south near Half Moon Bay, and Fort Bragg, to one shop or place or another. They borrowed money against the estate and it didn't pan out.

Lage: You had kind of a traveling childhood it sounds like?

Hedgpeth: Well, in my school record---

Lage: A year in each school.

Hedgpeth: Yes.

Lage: Was your mother a predominant influence, would you say?

Hedgpeth: Yes. Well, that and the house. Of course, it was a big house. We stayed there. It was probably my generation that spent more time--. We called the house 929 [street address].

Lage: This is the one in Oakland.

Hedgpeth: Yes.

Lage: How much time were you there?

Hedgpeth: Several years in the twenties. For a while, we lived in Berkeley and I took the streetcar to 929. My father was working in shipyards during the war. First he started out in Stockton. We moved down from Clipper Gap to Stockton. That was around 1917 or so. He got a job at the Holt manufacturing plant. They had the contract to make tanks for the British army. He worked on the big steam-powered hammer, bending armor plates, curved ones that fit in the front of the tank. Once in a while, I used

to take his lunch over there to him. We lived about two blocks away. That house is still standing; it was a cheap little cottage, but it's still there. At least it was the last time I was in Stockton and I went by there. It is on Pilgrim Street.

So then we moved up to the mountains, up to Mather.

Lage: Do you remember that pretty vividly?

Hedgpeth: Yes. I was ten years old.

Lage: You were in Oakland in between.

Hedgpeth: Yes, or actually, we lived also in South Berkeley. That was where we lived when he was working in the shipyard. Of course, in 1919, the contracts ended and work wound up by 1920.

In the summer of 1920, we spent a couple of weeks near the Big Basin in a rented cabin on the San Lorenzo River. The train stop was Brackney. It was our family's happiest memory.

Some Early Memories and a Traumatic Injury

Lage: You told me, before we turned the recorder on, your earliest memory was being reintroduced to your mother. Do you really remember this?

Hedgpeth: That's what bugs me. I have this memory, very distinct, of about three men and a woman. I was in a crib. One of the men was wearing a head mirror, like those used by doctors.

I was just coming into consciousness. I had been here unconscious or asleep or something. I don't know which. I don't know whether he said, "Don't be frightened," or anything, but anyway I do remember he said, "This is your mother." That's all.

Lage: This was when you were ill at about age six months and went to the hospital for several weeks?

Hedgpeth: Yes.

Lage: Isn't that strange. Did you ever talk to your mother about it to see if she remembered that?



"Sierra Bill" at Mather, Yosemite National Park, July, 1921.

[About a month before my accident.]

Hedgpeth: No. In fact, I'm not sure it occurred to me until afterwards. It's not the kind of thing you would make up as something you wished had happened or anything.

Lage: No, not at all. But it seems so young to really have a memory.

Hedgpeth: True. Well, I don't know. I see by his latest book [*Let the Mountains Talk, Let the Rivers Run*, 1995] that Dave Brower can also remember from the same age.

Lage: What about this note [in the photo album]? "It's a long story why I remember these flowers." You have a drawing which I assume is your drawing.

Hedgpeth: Yes. Well, what happened was my father, of course, being a blacksmith, didn't quite understand what an automobile was. It works by explosions, and the force is transmitted by gears, and the thing is controlled by electricity. These three different things were all a little much for him to figure out. We had some great big old Haynes automobile, we were heading out one afternoon for an excursion, slid off the road and wound up against a tree about six or seven feet off the road. Nothing spectacular or unsafe or anything, but I think he had put the steering gear back with baling wire or something, which he shouldn't have done.

So anyhow, while they were arguing and waiting for rescue, I sat in the middle of this beautiful patch of these little owl clover, the yellow ones. Very nice little flowers.
Orthocarpus. Cream sacs is the English name.

Lage: This must have been about age four?

Hedgpeth: No, a little older than that.

Lage: What would you say your parents encouraged in you as you were growing up? Maybe not the same thing from each parent.

Hedgpeth: That's true. My mother definitely didn't want me to go into a trade or become a blacksmith. She hoped I would become a lawyer or doctor, something like that, go to college, that sort of thing, which I eventually did.

Lage: Did your father think that was a good future for you or did he want you to work with your hands?

Hedgpeth: No. He didn't offer to teach me his trade, though he asked me to help him now and then when he needed somebody to hold the other end of a large piece of iron or something. I never asked.

Of course, after I hurt my hand it was impossible for me to do that anyway.

Lage: That happened at Mather?

Hedgpeth: Yes.

Lage: What were the circumstances?

Hedgpeth: There was a fulminate of mercury cap that I found in a shack I was putting on the end of a stick.

Lage: What kind of mercury cap?

Hedgpeth: A blasting cap. They are mean things.

Lage: You were just playing?

Hedgpeth: I was working it onto this stick and it went off.

Lage: Did you know what it was that you had in your hand?

Hedgpeth: No, I didn't know what it was.

Lage: You were just playing. That must have been pretty traumatic.

Hedgpeth: Yes, it was. [I should have thought to remember that I was playing at blacksmithing at a small forge my daddy had made for me. Every trace of it was gone when I returned from the hospital. --JWH]

Lage: How long were you in the hospital then?

Hedgpeth: What was it? Six weeks or something? No, it wasn't that long.

Lage: We had the bill we were looking at. Six weeks and the bill came to \$90.

Hedgpeth: \$90.11 does it say? Three weeks? August 17-September 9, 1921. About three weeks. It was shock and everything.

Lage: Your mother's shock must have been great also.

Hedgpeth: Oh yes. She accompanied me to the hospital of course. They just put us on an empty boxcar and that was that.

Lage: You took a boxcar down--?

Hedgpeth: It was a regular running train. There was no special run or anything.

A Family of Aunts--Family Stories

Lage: Then you moved back to the Bay Area.

Hedgpeth: Yes. My mother bought this place over in San Leandro and set up a drygoods business, emulating her sister, my Aunt Edith, who had become a very successful merchant in Walnut Creek.

Lage: So the sisters did go into business?

Hedgpeth: She was the only one who really went into business. My Aunt Elva was a probation officer. She worked with Earl Warren when he was D.A. for Alameda County. Then of course, my Aunt Geraldine was a school teacher. She had been asked by a chum to go over with her when the friend was trying to enroll in the normal school in San Francisco. I don't know what she had with her. My impression is she didn't have anything except she wrote her name on a piece of paper along with her friend and got in there. The superintendent came out and said, "Yes, you are both accepted." My Aunt Geraldine was too flustered, I guess, to say no, so she entered normal school and became a teacher.
[laughter] At least that's the story.

But she became a very good teacher. She was held up as a national model for her handling of retarded and disadvantaged students.

Lage: So she went into special education?

Hedgpeth: Yes, but she had never had any training in this. Some of her methods are now, of course, illegal. She went around and got written permission from all the parents to thump the kiddies with a ruler or whatever other corporal punishment might be necessary. She told most of them, "You're not stupid. You just haven't got the advantage. You're trying to speak a foreign language. Your folks don't seem to know anything at home. You'll just have to do it by yourself." For years later, her students used to come around to see her. They had gotten jobs as waiters and bellhops and similar levels of employment. Just a few years before she died, quite a delegation--there were a couple of dozen of them I think--came around on an occasion, her birthday or something, I don't know what at this point. There is a piece in the paper about that.

Lage: Was she teaching in Oakland?

Hedgpeth: Yes. She taught what is called Z-section. They are the same kind of people they have too many of now. There is nothing done at home to help them out. Their parents may not even speak English. She once got into quite a fight. She was taking a course--teachers are always taking courses to get more units to get another raise in pay or keep their salary status--in Berkeley, or starting to.

Anyway, she got into an argument with an instructor and said, "You don't know what you are talking about." The instructor got annoyed and said, "Madam, there is not room for both of us in this room. Either you or I are going to have to leave." She said, "That's all right. I'll leave." The other teachers said, "No, we want to find out what this is all about." The poor guy had to back off a bit. Finally, she had gotten him tamed down, I guess. He was afraid to say anything serious, I presume. Then he said that he wanted to obtain some returns from the students on their reading. He handed her a bundle of forms. She said, "This is a waste of time."

Lage: She said, "This is a waste of time"?

Hedgpeth: Yes. "They will sit down and write something about a book they have never read just to satisfy you."

Lage: She was pretty outspoken.

Hedgpeth: I think you should knew that this whole crew of ladies had very strong opinions of what they were going to say. They seldom if ever spared you their opinions.

Lage: Is this true of your mother also?

Hedgpeth: I had a feeling she was a bit more diplomatic, but not too much.

Lage: They all should have been lawyers, probably.

Hedgpeth: Probably. They missed their calling. Of course, in those days women lawyers were just beyond the pale. It was a thing ladies didn't do. Don't ask me why.

My mother loved to tell stories about her adventures, mostly involving my father's misfortunes or something or another like that. He used to leave the room. But when she got together with this Mrs. [Constance Bigelow] Mainwaring, the friend she had made in the mountains, they really could spin them.

Lage: Were these told at the expense of your father more or less?

Hedgpeth: No. These were just stories about everything, about adventures in the mountains or snakes and robbers and so forth. In fact, I have memories now of wild days in Clovis and Samson's Flats and other places in the Sierra--.

##

Hedgpeth: I still see Dan's [Mainwaring] professional name and credit line. He wrote a lot of the scripts for Errol Flynn under the name of Geoffrey Homes, his two middle names. The Bigelows had some genes for writing, and one of my cousin's boys, Michael Bigelow, is on the *Chronicle* staff today.

Lage: Did you know him from Clovis and Samson Flats?

Hedgpeth: Oh yes. He was one of the kids whose little sister I favored with the frogs.

Lage: I see. [Laughter]

Hedgpeth: Dan wrote a novel. His first novel [*One Against the Earth*] is very much like *In Dubious Battle* [by John Steinbeck]. A piece got written about that by a friend of mine. [Richard Astro, "Steinbeck and Mainwaring: Two Californians for the Earth." *Steinbeck Quarterly* vol. 3, no. 1: 3-11, 1970.]

Lage: About the similarity?

Hedgpeth: Yes. The piece was partly my doing.

Lage: When did he write the book?

Hedgpeth: The book was published in 1933, which was three years before *In Dubious Battle* was written.

Lage: Was it enough alike that you assumed it was an influence on Steinbeck?

Hedgpeth: Well, nobody knows. His mother thought that Steinbeck stole Dan's thunder. It was talking about the same things. They both had the same ability for describing scenery. I have a copy of that I loaned to Gerald Haslam, to see if he could do something with it. I told James Hart once, "You left him out of your book of California writers." Dan was writing detective stories by the bushel under the name Geoffrey Homes for years. Hart said, "Go ahead and write him up." About that time, Dan's sister

Nell, named for my mother, began to lose her mind. It was probably Alzheimer's.

Lage: I've been talking about this with other people, that Alzheimer's seems so common now and yet, looking back, do you remember a lot of older people that had similar symptoms but just no real diagnosis?

Hedgpeth: It never happened in our family. Everybody kept a clear mind.

Lage: Did they all live to a pretty good age?

Hedgpeth: My Aunt Doll lived to be ninety-nine. Most of the others lived to their eighties except Isadore, who died young, and Elva who had bone cancer. My Aunt Jane was run over by an automobile in what is now the Haight Ashbury District. She wore dark clothing and was attending various evening classes for self-improvement. She was into everything like this at one time or another. She once had a soldering iron and did burn work on nice new pine. It was called xylography.

Lage: They sound like very independent women.

Hedgpeth: Yes, they were all different, to say the least. My Aunt Elva was the domineering one. She was the one who arranged things after my grandfather's death. I was looking at his will yesterday.

Lage: When did he die?

Hedgpeth: He died in 1921. [shows will] He wrote this will on the 6th day of June, 1921. Since it is typed, I assume he dictated it to his secretary. He was almost completely blind; he could barely find his way home. He goes right down the list and he specifies, being an attorney, some material object from the house for each and every one specifically. There is a legal reason for this, you see.

Lage: What's the legal reason?

Hedgpeth: So that they not be neglected in anything. [Reads from will] "I give and bequeath to my daughter Nellie T. Hedgpeth of Berkeley two water colors frames hung in the front of my house." These happened to be pastels. I don't have them here on the wall anymore. "A framed agate piece made by her grandmother Elizabeth Tichenor, now hanging in the sitting room, and my library table now at the library at my house." That's the table there [indicates]. I got the agate thing. It was a box with a glass cover and the agates are all glued up in designs. After a

few years, it began to fall apart. Finally, the whole thing fell apart. So I don't have that anymore.

Then you go down here. "Painting and frame representing school examination. Woodpath Library of University Literature in twenty-five volumes to my daughter Susie. To my daughter Elva, the picture of the old harbor and my marble-topped rosewood table." My cousin has that now. That's the one they laid out the babies on when they died. "Aunt Hazel [Doll] Nasburg, sailboat on the beach."

Then he even includes me in this thing. Each cousin in the next generation, we each get \$100.

Mrs. H.: Seventy years ago that was a lot of money.

Hedgpeth: I got two framed "water color" pictures, each of a single bird, now hanging in the library. Those turned out to be chromos of magazine covers. I had to take the glass off one once. They are not paintings but they are nice frames. That's all I got out of it except, of course, the \$100.

Lage: Was his money--?

Hedgpeth: He was a lawyer.

Lage: I know, but what did he do with the--.

Hedgpeth: Okay, that's complicated, because the money borrowed by Edith he cancelled, because she was divorced.

Lage: That was not approved of?

Hedgpeth: Yes. He disapproved of him. He cancelled for her. The one successful one, Hazel--he called her Doll--had married a merchant in Coos Bay, Oregon. It used to be known as Marshfield. They ran a stationery store there. Paying back, some of it he cancelled.

Lage: He had made a loan to her also?

Hedgpeth: Yes. "I nominate and appoint my daughters Elizabeth McGraw, Edna McGraw and Elva B. McGraw the executrixes in my last will," and so forth. He had given all his money in sections. I think each got about \$20,000.

Lage: So he divided that rather evenly?

Hedgpeth: Here we go. "Section 21, I give and divide and bequeath all the rest, residue and remainder of my property whatsoever situated in equal proportion to my daughters," listed all by names, "or the survivors at the time of my death provided either of said children should die before I do leaving a child or children surviving. Such children will receive that share. I make no other provision for my son Frederick B. McGraw for the reason that he has already all of that portion of my estate to which I think he is entitled." He did give him his gold watch.

Lage: He had given him a considerable portion earlier?

Hedgpeth: He was borrowing money all the time. He was in all kinds of little things that didn't amount to anything. You can follow it through the city directories. I went down to Bill Sturm, his little parlor down there in the Oakland Public Library. Incidentally I made a file about the old house, photos of the interior (by my mother), floor plans and all for his collection about old Oakland houses.

Lage: Did Edith, the one who had been divorced, get an equal share?

Hedgpeth: Who?

Lage: Was it Edith who had been divorced?

Hedgpeth: Yes.

Lage: Did she get an equal share?

Hedgpeth: Yes. It calculated out. "Whereat and Whereabout, April 4th, I purchased my daughter Nellie some lots of land and so forth, at the expense of \$2,650." He took that out. Of course, she sold the property at Clipper Gap later anyway, so that isn't quite as bad as it looks there. A loan and so forth, \$500. "Said sum of \$2,000 ought to be considered an advancement to my daughter Nellie and shall bear interest from the 24th of April until my death 3 percent per annum. The distribution of my estate, 7/8ths of said sum and interest earned shall be deducted 1/8th share," and so forth. You won't follow all that stuff. But anyway, they were all cared for and I think they each got about \$20K. He would have had a lot more money if he hadn't invested in mines and similar schemes.

Lage: Did this make your mother secure then? Would that have been a sum of money that would have left her in a secure position?

Hedgpeth: Little enough to get along with. The story of all this--. He wrote this will on the 6th of June. He died on the 3rd of

August, 1921, two months afterwards. He came home, said, "Well daughters, girls, I've given up. I'm not going to work anymore." He went to bed and died, several days later, of course.

The reason the family lived there was because he couldn't get around too easily. He knew the way, the trains in San Francisco. His office was on Pine Street. It was only about a quarter of a mile from the Ferry Building, I think--the 300 block.

There is something here about his law. He had a junior partner at the time. There we are. Barry. Yes. The number is 354 Pine Street. "I here bequeath to my friend, Joseph E. Barry--" all his legal library. Of course, he had built up quite a heap of that too by that time, and he must have replaced most of his loss from 1906.

Early Interest in the Natural World: Ants, Seashells, and Childhood Reading

Lage: Did any of these early experiences, any of them, bring you in the direction of your interest in the natural world? That hasn't come out.

Hedgpeth: No.

Lage: Were you a budding naturalist as a boy?

Hedgpeth: My mother said she could always find me if she knew where the nearest ant hill was. When I was very small, she would visit people, especially out in the mountains and so forth, I would wander off, so she just kept looking out for the ant hills and she would find me watching the bugs crawl around. It was more than ants quite often.

Lage: Are these vivid memories for you?

Hedgpeth: Well, I do remember looking at ant hills and just looking at things moving and wiggling around.

That's where the natural history aspect became serious.

Lage: When did your interest in natural history become serious?

Hedgpeth: Well, see, next door--[shows picture] Next door to my grandfather lived Henry Hemphill, who was a very famous shell collector and a pretty good student of mollusks. He didn't just gather them. He arranged a lot of his shells on cards to show all these evolutionary sequences or relationships in a rather interesting way. But the whole house was full of stuff. It was sort of like the pictures of the grand salon of the Nautilus from *20,000 Leagues Under the Sea*. They had a parrot that was quite often aired out in the backyard.

I used to go over there quite often to see the seashells, and ask Bee [Jennie Hosmer], who was Hemphill's granddaughter, to open it up so that I could see them. In fact, it all started one day when she offered to show me and my cousins the seashells. They never came back, but I kept coming back and looking at them.

Lage: So it really kind of entranced you.

Hedgpeth: Yes.

Lage: You say that it was all organized and displayed in such a way that it made some sort of--?

Hedgpeth: Well, all these displays were not in view. They were in drawers and things. They had very fancy cabinets of course. [The remains of the collection are now in the possession of Dennis Murphy at Stanford, a descendent of Hemphill. --JWH] For a while, my Uncle Fred was trying to collect shells. He started to build up a collection. He had a cabinet but it was relegated to the attic in my time and there was hardly anything in it.

Lage: You didn't build on that.

Hedgpeth: Right. The other thing of course was that my grandfather had a library. My education may be mid-Victorian rather than post-World War I influences because the attic had a good stock of old children's magazines, serials and things. *Harper's Roundtable*. How they happened to subscribe to that instead of *St. Nicholas* I don't know. This man Kirk Munroe was a very good writer. He edited the magazine.

Lage: Was this writing for boys or for adults?

Hedgpeth: Primarily for boys and/or girls. One of the best ones he wrote was called *The Flamingo Feather*. It was in print as late as 1940. He moved down to Florida and became very friendly with the Seminoles. I looked him up in the *Cyclopedia of American Biography*.

Lage: What was his name?

Hedgpeth: Kirk Munroe. Apparently, he was the person who introduced organized cycling in this country. Those were the days when you had wheels about six feet in diameter. How you managed I don't know.

Lage: But he wrote natural history?

Hedgpeth: No, he wrote stories and they had quite a lot of natural history. Actually, in reading about him I find that one of the things that he did is that he never wrote about an environment that he hadn't seen. So he was going out on all kinds of field trips casing up these places. He wrote one about the Painted Desert, which I remember very well. Then I remember something else. [retrieves book] In one of these books is a little German song. For about seventy years I've tried to find that song. Anytime I saw a book of German folk songs I would flip it open. The last trip to the local library sales about two or three months ago here, I found it in this book. The reason I hadn't found it was because it was Swiss. This book is brand new, obviously never been sung out of, not been squashed flat on a book rack or anything. It's got nice little color plates in it. The first line of the song is "Wohlauf in Gottes schöne Welt." My Aunt Edith translated it for me. It was the first time I had ever become aware of the German language. This was a story about people coming West in the wagon train and they were singing this song.¹

Lage: That's why the song appeared in the story.

Hedgpeth: It appeared, and I had been looking for it ever since. Then all of a sudden...

Lage: You really had vivid memories of these books that you read.

Hedgpeth: Yes. Well, I had one--. It was a nice big book. I can get it for you if I had to. It's very easy; I know exactly where it is. That's why I wish I had been there, because this copy is not very good binding; it's secondhand.

Lage: You mean, you wish you had been there when they divided up your grandfather's things.

Hedgpeth: Yes.

¹"Wohlauf in Gottes schöne Welt," Schweizer Singbuch. Mittelstufe, Ausgabe für den Kanton Zürich, Verlag Hug & Co., Zürich, 1960.

Lage: Did you get much of the library?

Hedgpeth: My mother grabbed a lot of stuff. He had a big library.
[Wanders off to get the book and sings]

Lage: What was that you were singing in the distance?

Hedgpeth: That was "Deutschland über Alles." [laughter] It's a very pretty tune. Do you have this thing on again?

Lage: Yes.

Hedgpeth: I've been to Helgoland and the words to "Deutschland über Alles" were written by Hoffmann von Fallersleben during a weekend at Helgoland. He deliberately wrote the words to fit Haydn's tune. The tune that Haydn wrote of course is the national anthem for Austria. The story goes that he once heard "God Save the King" and tried to write a similar tune for his own country. Haydn of all people knew how to write singable music as you may have noticed. Have you ever been in a choir?

Lage: No, I haven't, unfortunately.

Hedgpeth: Anyway, I thought it was kind of treason to take a tune like that, the so-called "Emperor Quartet" or "Emperor Waltz," or anyway, Haydn's name for it. "Deutschland über Alles" is essentially a bunch of corn. I took some satisfaction in learning that this publisher had paid him 30 Kroner for it. [laughter].

Anyway, this is one of the principal influences. This is *Sea and Land* [Sea and Land: A Natural History of the Sea, by J. W. Buel]. [shows book]

##

Lage: Was this a book of your grandfather's?

Hedgpeth: Yes, it was in his library. Not this particular copy; I bought this one at a book store later for I think seventy-five cents.

It was sitting in his library; it looked like a law book. Same old calf-colored thing, about four inches thick. This is a subscription-only thing, by a man named J. W. Buel. "A wonderful curious thing of nature existing before and since the deluge. An illustrated history."

Lage: I can see how this picture, this frontispiece, would capture the imagination of a young boy though.

Hedgpeth: Yes, it looks like a circus billboard, a little bit of everything. It's got all these pictures. Some of them are not very well--.

Lage: [Reads] "Mysteries of the deep sea."

Hedgpeth: Yes. This copy, alas, is falling apart.

Lage: How old would you have been when you discovered this?

Hedgpeth: It was right down on the lower shelf. I discovered it as soon as I could read, somehow.

Lage: You had to read pretty well to plow through this.

Hedgpeth: The second half is about land. Obviously all these animals do not occur on the same continent. You have an anaconda, a crocodile, lions and tigers all mixed up in a glorious mess. Here are South American Macaws sitting there.

Lage: Is there an evolutionary approach?

Hedgpeth: Not really. It's a rather primitive evolution to say the least.

Lage: It refers to the deluge, "Shall the earth be again destroyed?"

Hedgpeth: Some of the facts in here are not exactly facts. One of the most notorious is of the nautilus flying in the air. This of course is an octopus, the argonaut. They build a little shell for the egg case. There is a picture in here somewhere showing it getting up and flying around. That is something we know can't be. Here are serpents: sea serpents!

Lage: There is the octopus, battle with the octopus.

Hedgpeth: This is from 20,000 Leagues; that's the picture. Doing a hatchet job on the octopus, or the great Kraken or whatever. Now, here we are. It shows this thing flying, which it can't do. These are specialized surfaces for building this egg case. It didn't walk around carrying it like a hermit crab either. Here there are sails, holding up the sails, the sail on the surface. It doesn't do any of those things in those three positions.

Lage: There are probably a lot of mistakes like that in there I would guess.

Hedgpeth: But in the middle of the book, there is something that is very fascinating. My first introduction to poetry. The pictures are

a bit small, but here is the entire text of the *Ancient Mariner*. Tossed in the middle there just to separate sea from land.

Lage: Did you like this book a lot as a child?

Hedgpeth: Oh yes. I read it over and over again.

Lage: Is this something you shared with your mother and aunts, or was this solitary?

Hedgpeth: No, just all by myself. In fact, my Aunt Edna unlocked the cases for me and that was about it.

Lage: Did the sea part interest you more than the land part of this book, do you remember?

Hedgpeth: I think it is accidental because it begins with the sea. By the time you've gotten all the way through and read the *Ancient Mariner*, there is nothing left of the day to go on. So you start all over again. I got into some of this: the troubles of Paul du Chaillu, a Belgian explorer in Africa in the 1860s who was alleged to have carried on improperly with gorillas.
[laughter]

Lage: This is in this book too?

Hedgpeth: I don't think that is. I picked that up somewhere else. So anyhow, I'm fond of the *Ancient Mariner*, to say the least.

Lage: Did your grandfather have a pretty extensive library?

Hedgpeth: He had a lot, because he had some personal experience, I think, so it was the year 1876 that he had gone back to Detroit for some purpose or another. Anyway, he had been pursued by Indians and barely got to a boat in some river like the Platte or a fork of the Missouri, or some place. So he had a lot of the classical books about exploring the West.

He had some pretty rare stuff, I gather. [After he died,] they called in the dealers. First came Paul Elder, the biggest second-hand antiquarian-type dealer in the area. He picked out what he wanted and then they moved on to Harold Holmes. My mother decided she wanted the encyclopedia. She put her name in the first volume so he took volumes 2-24. I argued with him ever after, but never got anywhere.

[Holmes was a bookseller long before the store on 14th Street in Oakland was built in 1924, and was called in to bid on parts of Grandfather's library. In fact, my mother knew the

Title Page, SEA and LAND. - R indicates lines printed in red.

SEA AND LAND.^R

AN ILLUSTRATED HISTORY OF

The Wonderful and Curious Things of Nature Existing before and since the Deluge.

EMBODYING DESCRIPTIONS OF THE MIGHTY WORLD OF WATERS, AND OF THE MARVELOUS CREATURES WHICH COMPRIZE ITS INHABITANTS.

BEING

A NATURAL HISTORY OF THE SEA.^R

Illustrated by Stirring Adventures with Whales, Devil-Fish, Giant Polypi, Sharks, Sword-Fish, Dog-Fish, Stinging-Fish, Crocodiles, etc.; to which are added Descriptions of all the Phenomenal Creatures and Things that are Found in the Deep Sea, together with a Full Account of the Remarkable Legends and Superstitions so Prevalent among Sailors.

INCLUDING

A HISTORY OF THE WORLD ASHORE, THE SURPRISES THAT ARE TO BE MET WITH IN ALL THE REGIONS OF THE EARTH, IN THE KINGDOMS OF ANIMAL, INSECT AND VEGETABLE CREATION.

ALSO,

A NATURAL HISTORY OF LAND-CREATURES^R

Such as Lions, Tigers, Elephants, Rhinoceros, Hippopotami, Gorillas, Chimpanzees, Mandrills, Bears, Wild Dogs, etc., with Hundreds of Thrilling Escapades illustrating their Character and Disposition.

TO WHICH IS APPENDED A DESCRIPTION OF

THE CANNIBALS AND WILD RACES OF THE WORLD.^R

Their Customs, Habits, Ferocity and Curious Ways.

BY J. W. BUEL.

Author of "The World's Wonders," "Heroes of the Plains," "Exile Life in Siberia," etc., etc.

ILLUSTRATED WITH 300 ENGRAVINGS, REPRESENTING THE WONDERFUL CREATURES OF THE WORLD IN THEIR NATURAL CONDITION, AND

SUPERB EMBLEMATIC COLORED PLATES.^R

SOLD BY SUBSCRIPTION ONLY.

Printed on verso: Copyright, 1887, by J. W. BUEL.

PUBLISHED BY

HISTORICAL PUBLISHING COMPANY,
PHILADELPHIA, PA., AND ST. LOUIS, MO.

THE ANCIENT MARINER.

PART I.

This ponderous book, whose outer appearance was that of a forgotten law book, not only introduced me to the wonders of the sea, but also the beauties of poetry by including as sort of divider between the creatures of sea and land, the complete text of The Ancient Mariner, with the woodcuts by Gustave Dore. When I ventured to ask our local ancient mariner an opinion about the artist's accuracy, he put me properly in my place.

I is an ancient mariner,
And he stoppeth one of three,
"By thy long grey beard and glittering eye,
Now wherefore stopp'st thou me?"
"The bridegroom's doors are opened wide,
And I am next of kin;
The guests are met, the feast is set:
Mayst hear the merry din."
He holds him with his skinny hand,
"There was a ship," quoth he,
"Hold off! unhand me, grey-beard loon!"
Eftsoons his hand dropt he.
He holds him with his glittering eye—
The wedding-guest stood still,
And listens like a three-years' child:
The Mariner hath his will.
The wedding-guest sat on a stone;
He cannot choose but hear;
And thus spake on that ancient man,
The bright-eyed Mariner.
The ship was cheered, the harbour cleared,
Merrily did we drop
Below the kirk, below the hill,
Below the light-house top.
The sun came up upon the left,
Out of the sea came he;
And he shone bright, and on the right
Went down into the sea.



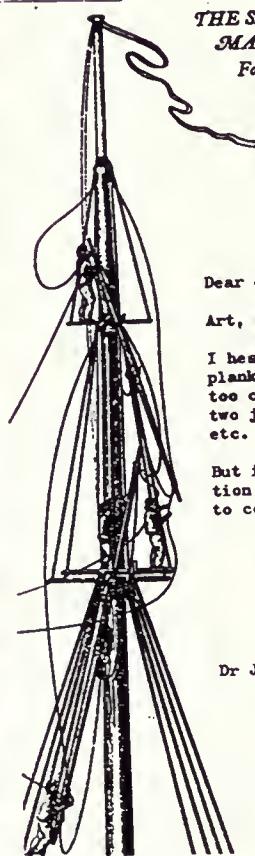
It flung the blood into my head,
And I fell down in a swoon.



THE WEDDING GUEST SAT ON A STONE:
HE CANNOT CHUSE BUT HEAR.

THE SAN FRANCISCO
MARITIME MUSEUM
Foot of Polk Street
San Francisco, California 94109
Karl Kortum, Director

4/23



Dear Joel —

Art, not accuracy . . .

I hesitate to begin . . . athwart
planks, wrong angle catheads, rig
too close to bows, deadeyes too s
two jibs where there should be on
etc.

But it is still as good an illus
tion for those two lines as is li
to come along.

Best,
Karl

Dr Joel Hedgpeth

family, and evidently met Emily, Harold's sister, in Berkeley, I think when she was living there with me during my last two undergraduate years. We wound up one summer at Emily's cottage near Occidental. By that time, she was getting dotty and the family was embarrassed by her, and trying to forget her. Fortunately, she began to worry about all the rocks the neighbors were throwing into her yard in Berkeley and left us to spend most of two weeks undisturbed. It was just after the narrow gauge railroad had been abandoned; most of the tracks were still there and the trestles were sound enough to be walked on safely, so we explored the countryside.

[Holmes Bookstore was for many years my favorite place to go and with its sad demise earlier this year I no longer have much to attract me in my native city any more. Harold C. Holmes was an entertaining fellow, often quoted Marcus Aurelius, but he died some years ago. For a while we impatiently waited for his memoirs, but they turned out to be a bust. He just didn't know how to write. But I found many good and interesting books there, and the great store's demise is another part of my life now forever gone. --JWH, October 1995]

Book Collecting, Book Critiquing, and Music

Lage: So you didn't get many of those books.

Hedgpeth: No. Some years later, I went in to the senior Holmes--. It's still the same store right by the Hotel Oakland. He had a great big German book, two volumes. There were a lot of textbooks that benefit from its illustrations. I grabbed it, a gold mine of nice pictures of animal gizzards and guts and also entire critters. Two great big heavy volumes, labeled \$3.00. I said, "Haven't you made a mistake here?" It was in Fraktur type. "Hell no. Nobody can read that stuff." The last catalog listing I've seen, it was \$250.

Lage: Did you buy it?

Hedgpeth: Of course I bought it. [laughter] I had an amazing experience here a while ago. I'm not sure I should have done it but my son Warren was asked into a big old house downtown by a client. It belonged to one of the early families around here, related to the Comstocks of Cornell University, great naturalists. He wrote a famous butterfly book. Warren said there were a couple of old books in there, so he arranged that I'd go look at them.

Two branches of that family don't agree on anything. So I looked at the books, and they had this autographed copy of Comstock's *Butterflies of North America*. I said, "That's a family heirloom sort of thing. You shouldn't get rid of that." She said, "I've had a hysterectomy." "Sorry about that." Anyhow, that ended that part of the conversation. Then there was a two-volume--. Actually, different editions of the same thing, of Perry's *Opening of Japan*, the book on the Pacific. These are books that had a famous picture that caused so much of a row that the government refused to pay for the publication of some of them later on, namely the Japanese bathhouse scene. It was considered very, very improper to even indicate that naked men and women wandered around together in such a condition. This was of course the 1840s. In some editions, these plates had been torn out.

Lage: They had two copies?

Hedgpeth: They had one copy of the first edition and the second copy of the library edition published a couple of years later, which has more color plates and very fancy full leather binding, a heavy processed thing. I said, "I don't know but I think these are probably worth about \$300. I'm not a specialist. Whatever you do, don't go down and let that swindler around the corner get his hooks into these things. He will tell you they are only worth about \$50 and offer you \$20." When I was away, she presented them via my son to me. She invited us to their housewarming. They built a nice house out at Dillon Beach. Warren designed and built the house for them, by which time I had learned that the real value of the second book, the last auction price, was \$650. I said, "I'd better tell you this." Oh, well... [laughter]

Lage: So you have them?

Hedgpeth: I have them.¹

Lage: Do you have quite a book collection?

Hedgpeth: Fair. I have a fair collection of books on the oceans and this [*Sea and Land*] was one of the starters of it; [unwraps it] this particular copy is a wreck. I would like to get a good one but I don't know, they're probably as scarce as hen's teeth now.

¹Hawks, Francis L. *Expedition of an American Squadron to China Seas and Japan, Performed in the Years 1852, 1853 and 1854, Under the Command of Commodore M. C. Perry*. 1856, 1857 (second, library edition, larger page and type size, with added illustrations).

Lage: Have you ever had it looked for?

Hedgpeth: I'm scared of those guys. They find it for you for \$100 and they get really mad if you don't buy it.

Lage: It might be worth it.

Hedgpeth: I don't think it's worth that much. I don't think it will ever sell for that much. There is so much rubbish in it. A lot of it is pure fantasy.

Lage: But do you think that's what attracted you in a sense? It's a very romanticized view.

Hedgpeth: Of course, I didn't know how bad, how inaccurate, some of it was, but somehow I didn't feel it was all quite up to snuff. I don't want to say I was wise before my time.

I know that the late George Myers, an ichthyologist at Stanford, said he had this book in his home too. It started him out. In fact, I wrote a little essay on seashore books and things like that, published in the *American Scientist* or something, a long time ago now.

Lage: On early books like this?

Hedgpeth: Yes. This business of writing books about the sea as such came along fairly late. There were all these books about cannibals and how to cook a missionary and that sort of stuff. They had been going for a long time.

Lage: Would Jules Verne have had some influence on popularizing it?

Hedgpeth: Yes. He had a great deal of influence. [holding copy of *20,000 Leagues*] This is a new edition. I'm writing a review. I'm on the editorial board of the *Quarterly Review of Biology*. Some chairman of the French and Italian Department at Indiana has translated it. He has no sense of humor and absolutely no knowledge of biology. He warns us that Jules Verne was fond of making puns and sly jokes. Then he gets completely suckered into one of them. There is a statement about quadrupeds and there are also quadrumanias. He gives a very solemn footnote verifying this as mammals that have four hands.

Lage: You don't think he's trying to be funny?

Hedgpeth: He doesn't know anything about it, or he wouldn't have said it that way. He said this is Latin for having four hands or

something. The only animals that behave as if they were four-handed are sloths.

Lage: Sloths?

Hedgpeth: The great three-toed sloth. It hangs by all four feet which are all more or less like this, a hook. In fact their rear feet are so thoroughly adapted for hanging just like that it can't even walk on them to flatten them out. They are obviously not hands. They are all toes. But anyhow...

Lage: Hand-like.

Hedgpeth: There are some other things, more technical. He corrects Jules Verne's statement of the longitude of a place "south of Japan" to read 37 degrees west, when it should have been east. So he states that the longitude of Tokyo is about 37 degrees west. He does that to correct Verne. I would hate to go sailing with this guy because I don't know where he would land us. I had to point out in my review that this places Tokyo about halfway between San Francisco and Honolulu. It has to say east longitude.

I met some people from Indiana a couple of months ago and asked about this guy. They said, "He's probably the most stupid man on the whole Indiana faculty." Well, I didn't know about that, but I'm not surprised.

Lage: He'll be waiting for your review, I'm sure.

Hedgpeth: I don't know. Most of the people who do these things don't even know that the *Quarterly Review of Biology* exists.

Lage: He may never see it. You can send him a copy.

Hedgpeth: I may do that because another edition came out about five years ago now, making some equally stupid mistakes. In both cases these guys haven't hired biologists or sent it to anyone for corrections or adjusting. Oh, well.

[looking at photo of grandfather's library] You see these great big enormous bookcases. There were two big units like that on this side. Then on the other side, this was the library room.

Lage: In the scrapbook here, you say, "Here I read my grandfather's books stretched out on the carpet."

Hedgpeth: I read at them. There is a piano here too, isn't there?

Lage: Not in the picture.

Hedgpeth: This was probably the most unmusical family in town.

Lage: They had a piano but it wasn't much used?

Hedgpeth: Nobody played it except my Aunt Edith played a little, but I don't think she ever took it seriously. The thing is, they would stand up for things like "Hail, Columbia" because they thought it was the "Star-Spangled Banner." They admitted that. They bought my grandfather a phonograph one year. This was the time when they still all were mechanical. They got some records to go with it. They got things like, "They gotta quit kicking my dog around," and "Mickey the Pum-pum Man." They were very trashy black seal records. They turned it on, Grandfather listened and said nothing. The next day he came back from the city having bought half a dozen great big fancy red seal records which cost about ten times the price of these black seal jobs.

In those days they sold things by sort of a rough scale. So when you bought a copy of the recording of the sextet from Lucia, you were paying for all six artists. It would cost six dollars. If you bought a single Caruso record, it might be a dollar. So he bought a lot of opera. They weren't much on symphony in those days. It was mostly vocal things because orchestras didn't record very well. And he kept on; there were a lot of them. One of my idiotic cousins made static machines out of some of them.

Lage: So your grandfather had more musical taste than the rest of them?

Hedgpeth: More than suspected.

Lage: How did you develop an interest in music?

Hedgpeth: Well, my father was a singer. He had no musical training. He couldn't sight read, and he couldn't sing parts. There is nothing more irritating than to be in the middle of a tenor section with some guy singing soprano.

Lage: I think we should wind up for today because we've talked for a couple of hours now.

[Tape is turned off. Resumes with Mr. Hedgpeth singing in German.]

Lage: When did you get an interest in choral singing? Was that as a young person?

Hedgpeth: No. My father always sang. I don't know where he learned some of the things he sang. He knew "Bonny Bobby Shafto." Every single trace of anybody from Northumberland in the family was long forgotten. My great-uncle Joel thought we were of Welsh descent; that probably came from memory about his grandmother Ruth Jones from Anglesey, but not a single word of Welsh came down to us.

Lage: How does "Bobby Shafto" go? I used to read that nursery rhyme to my daughters.

Hedgpeth: [Sings "Bonny Bobby Shafto"] The town of Shafto, or the place of Shafto, is very close to the little village or farm of Hudspeth [pronounced Hedgpeth] in Northumberland. That's where my father's family came from some centuries before. It's very curious that the McGraws, to whom I owe most of my background, were the last that I know of to come to this country. They came to New York in 1801. Two brothers came as indentured servants from Ballylain, County Armagh in Ireland.

Lage: Your father's family came much sooner?

Hedgpeth: Well, the Hedgpeths were showing up in the 1690s in Virginia and the Carolinas. They were in the Revolution and the War of 1812. Of course, later some of the Hedgpeths wore gray uniforms. On my maternal grandfather's side, his brother was a surgeon in the Civil War.

Lage: On which side?

Hedgpeth: The Union. Michigan Volunteers. One of his McGraw cousins was killed at Gaines Mill. That part of the history is also 199 percent U.S.A. Our names are plastered all over the place.

Lage: Has the spelling changed? You've pronounced it sort of Hudspeth when talking about the older--.

Hedgpeth: That was for the sake of making it plain. It's pronounced Hedgpeth. To this day it's spelled Hudspeth in Newcastle, and the man whose name is Anderson who now lives in the place called Hudspeth in Northumberland pronounces it Hedgpeth. There are thirty Hudspeths in the Newcastle phone book, and the American spelling Hedgpeth is a phonetic spelling. In our family line my great-grandfather Joel Hedgpeth married Jane Hudspeth.

Lage: But the spelling is the same.

Boyhood Wanderings in the Sierra Foothills, 1920-1921¹

[Interview 2: July 2, 1992] ##

Lage: Last time, we talked about your wandering around in the deep meadows, out of Oakland and up to the mountains.

Hedgpeth: Yes.

Lage: And how that might have made you who you are. How much time were you in the mountains and what part of the mountains and what kinds of things did you do there?

Hedgpeth: That was after World War I. My father had gotten a job with the city of San Francisco in Mather. He had gone up ahead of us.

Lage: That was related to the Hetch Hetchy project?

Hedgpeth: Yes. Mather was where they had the sawmill. The place was originally "The Hog Ranch." They had to run the sawmill to cut timbers. They did a lot of tunnel work and concrete pouring requiring all kinds of timbers and so forth and planks, so they had their own sawmill. There was another mill about a mile away over the hill for the peach growers. That primarily was for light duty stuff, namely for boxwood. In those days, wooden boxes were the thing.

My mother and I started off. We traveled by train. San Francisco had a railroad, going up from Oakdale through Groveland ending at the damsite, so we changed cars. I remember it was a very hot day.

Lage: Was this about 1921?

Hedgpeth: 1920-21; in that time frame. After Groveland, which was the project headquarters and main division point of that railroad, where they kept the roundhouses and the sidings and all that sort of stuff, the route began to look very pretty. It was right along the edge of the Tuolumne River gorge, so we were going really into the mountains. Obviously, it was spring in

¹See Appendix A, "A Boy's Life at Mather," for more memories of these years.

the mountains, primarily nearer to summertime down in the lowlands.¹

Lage: Was that your first trip up to the mountains?

Hedgpeth: Well, it was my first trip to that area. I had been in the mountains when I was very young, though. I have no clear memory of it, except on Whisky Creek, when I was just a few years old, several times. I have a dim memory of that, of my father carrying me for miles through a snowstorm. I remember very clearly, when we got into a warm house, how good that felt. He had walked along ahead and left my mother to find her way. She wandered into some farm house and spent the rest of the night there, and waited until morning to find out what had happened to me. That was one of the stories she used to tell with great gusto.

Lage: You had gotten caught out in the snowstorm unexpectedly.

Hedgpeth: I must have been about three years old. Anyway, at Mather we arrived in daylight. At first, there weren't any places for us yet. So we stayed in tents in a couple of places. First at Buck Meadows; you know where that is. That was a few days. Then down in the deep low meadow below the tracks, which is the loveliest place for mosquitoes; it's simply unbelievable.

Lage: You stayed there for a while?

Hedgpeth: Not very long.

##

Hedgpeth: There were dorms for the working crews, who were mostly bachelors. There were not very many family units, probably only a dozen or so. I was the only child of my age there.

Lage: Why did they need a blacksmith? Were they still using horses or was he doing--?

Hedgpeth: That was still before the days when you had complete parts and things, ordered from the factory. So when some of these big machines broke down, parts had to be repaired by hand. Sometimes it would be recast and it was stuck and you would have

¹Ted Wurm's *Hetch Hetchy and its Dam Railroad* (Howell-North Books, Berkeley, 1973) is a thorough, lavishly illustrated account of the entire project.

to part with a lot of minor things. It had to be maintained that way.

Lage: So it was machine works.

Hedgpeth: Yes. Finally, we had a house up there on a little crest overlooking the mill, but you couldn't see very much because there was a fair number of trees there at Mather. Of course, the last time I was up there, they had let part of it go bad. The meadow that I remember was all this thicket of second-growth small pines and a horse corral. Because it was a national park, they weren't supposed to do anything.

Lage: So is it part of Yosemite, this area?

Hedgpeth: Yes, it was part of Yosemite National Park. In fact, it was a way stop for the excursions from down in Yosemite up to Hetch Hetchy. You would stop there for lunch. These great big, open, green touring buses--Pierce Arrows--there were probably twenty-five or thirty people apiece. They were considered pretty big things in those days.

Lage: Did you see those go through?

Hedgpeth: Oh yes. They stopped there for lunch. These box lunches were very elegant things that they packed in those days, little bits of candy, pieces of pie and all kinds of things. I began to sing for the hors d'oeuvres.

Lage: Sing for your supper.

Hedgpeth: I did also that. If I knew a new dirty--or a new swear word, why, the cook would give me a piece of pie. It wasn't really a town, it was just a mill and the accompanying buildings. Most of them were bachelors; they did run a mess. They came to the mess hall, so they had a cook. He made a particular brand of probably what I would now consider indigestible apple pies, that he would give me a nice big piece of if I learned a new bad word.

Lage: That's encouraging you in the right direction [laughter].

Hedgpeth: Yes, wasn't it? The tourists called me Sierra Bill.

Lage: What did the tourists like to hear?

Hedgpeth: They liked to hear me sing.

Lage: What kinds of songs?

Hedgpeth: I don't remember what I sang in those days. I stood on a tree stump.

Lage: So that was what a boy did who didn't have any boys his age in that area.

Hedgpeth: That's right. Actually, I think most of the kids--there were not very many--were teenagers. Older children of families, you see. There was this gal--I never did learn her last name, but never forgot her first name. It was Leafy Fern. She had a suitor who kept carving her very nice heart-shaped boxes out of yellow sugar pine bark. He was pretty good at it; I remember that. After a while, they went down to the towns somewhere, and I suppose they got married; I don't know.

Lage: Did your mother try to encourage you in different directions from the cook? Did she know about your carryings-on?

Hedgpeth: I don't think she did too well. There was one day there where this old character appeared on the scene with his two burros and the saddlebags full of hymn books. There was kind of an arena in a grove there, campfires and so forth, public functions. The nearest thing to a meeting place the town had. A fireplace, just some logs or planks to sit on. I started helping him unpack the books. He wanted to know what my name was and I told him. He said, "Oh. I know your mother. Please take me there." He was one of her old missionary friends. His name was Hugh Furneaux. In that thing you have about Mather and later in the Tuolumne County Magazine, he's there.

Lage: Right. With his two burros.

Hedgpeth: He had custody. One of them was called Bagpipes. I don't know what the other was right now. Anyway, when he went down to the city, he left them with us. At that time, we were staying at a different place. We moved out for a while for some reason and down near what was then the Oakland Municipal Camp, which was about five or six miles south. He left his burros with us while he went down into civilization for three or four weeks or something like that. Time in those days gets confused. You don't know which came before or after. Some people do. My memory didn't keep the times too well separated.

Lage: I wouldn't think so, this far removed.

Hedgpeth: Anyway, I rode one of those burros around. It was quite an education.

Lage: An education about burros?

Hedgpeth: Yes, about burros, donkeys. They have minds of their own.

Lage: That's what I've heard.

Hedgpeth: There was, I guess, a branch of the upper middle Tuolumne going through there. It wasn't much of a river there; it was pretty shallow but it had a big plank bridge across it. Trying to get that donkey to go across that bridge! He stomped on it with his feet. Because it wasn't nailed down tight, one of the planks jiggled under foot. He backed off. He wouldn't go. He backed off again. So I went down to where the river looked shallow enough--it was--and we got out in the water. He decided he didn't want to ford the river with me aboard, so he threw me off into the river, walked across by himself, about a foot deep or so, and he stood there and waited for me to wade the river.
[laughter]

Lage: So maybe you learned something about stubbornness from him.

Hedgpeth: Maybe. I don't know. But I learned something anyway.

Lage: What about the preacher friend? Was he a memorable character?

Hedgpeth: Well, he was a very nice man. He baptized me. That's about all I remember of him clearly. He corresponded with my mother for a while. He had this very fancy, heavy handwriting. I seem to have lost or mislaid the gospel hymnbook he left with us. He had written in it and put a date in it by the way too. The date was '21.

Anyway, I led him back to our cabin. My mother had him over for dinner and had him baptize me.

Lage: She had been waiting for someone to come along.

Hedgpeth: I don't know; I think she just had the idea that maybe it was about time I had a middle name, I guess.

Lage: Now Mather, it became the San Francisco Family Camp?

Hedgpeth: It still is, I think. Amy--what is her name? She is a very active environmental type.

Lage: Amy Meyer?

Hedgpeth: Yes. She was up there a few years ago.

But the tree they had cut down on a Sunday one day there, some of the logging crews I guess, felling crews, this was the

biggest tree around there, right near our house. They cut it down and cut it up in lengths of four or six feet. I went away, and those pieces were still there the first time I went back with Bill Boly, my daughter's brother-in-law, to show him the ground and how to get from here to there and all that sort of thing. We went all the way up to the dam at that time. Then Amy wrote me a note saying that after that, those pieces had disappeared. They were all weathered, an ash white color. There a long time, forty years I guess.

Lage: Someone carted them off.

Hedgpeth: Finally. It was one way I could recognize the site of the place. I have a very good memory for places.

Lage: Did you get up to see the dam being built?

Hedgpeth: Yes.

Lage: Any memories about that?

Hedgpeth: They had an excursion for employees. It was on a Sunday, I believe. Well, at that time, there may have been Sunday crews working, they had to go down an incline, down on the cable tram in a kind of crude conveyance lowered by cables on the track down to about the level of where the tunnel comes out at the dam. We went through that tunnel for several miles on a flat car, on a little two-foot-wide train.

Lage: Through the tunnel?

Hedgpeth: Yes, we went through the tunnel. There were electric lights along the roof. It came out at Early Intake and then they turned us loose to walk back, to go back up the hill to Mather. I didn't like it because it was kind of a scary thing, to go down a steep cable tram like that and see all the fresh blasted sides. They were still making the key ways. The key ways are the part of cutting into the rock on either side and through all the wires and timber supports. So you could see what they were doing to the country; you could get a view of the valley.

Lage: But the valley itself was still intact then?

Hedgpeth: No, it was pretty well cut down by then.

Lage: Oh, they cut down the trees?

Hedgpeth: Oh yes. They would clear out all the trees. They would do this any time they would build a dam. I think probably they were

going to use some of those logs, take them down to the sawmill and chop them up.

Lage: Did that make an impression at that age?

Hedgpeth: It did indeed. I never cared for dams after that. I went back there with a Boy Scout troop in 1924, and we went down inside the dam. That's just kind of a scary business, too, because whatever else you may think and how safe it may be, if you go down in those tunnels, very far down, they are kind of drippy.

Lage: There is always the water leaking.

Hedgpeth: Yes, and when they are operating the turbines, it makes a noise and gives you a sense of something going on, quivering within something of the structure. It doesn't feel like it's a very good place to stay. So you were very happy to get out of there of course. I'll have to brush up. I don't know how to describe the process anymore.

Lage: It will come to you. So when you went back the second time, the reservoir was there.

Hedgpeth: Yes, it was pretty well established.

Lage: The dam was finished and the valley was a reservoir. It's interesting that at that age you were aware of the kind of devastated landscape and all.

Hedgpeth: Yes, I always remembered that. I suppose the accident I had didn't help either.

Lage: What kind of impact did your accident have on you, do you think? This was the dynamite--.

Hedgpeth: Well, the immediate impact was extremely sensitive. Certain things you couldn't do with your hands I still can't do, as a matter of fact. They put a thing like this back together as much as they can. They don't put nerve endings in anywhere. Some tactile sense is gone and others are increased. When you bump it against something it really hurts you--.

Lage: The pain is--.

Hedgpeth: It doesn't last long but it is very acute.

Lage: Even now?

Hedgpeth: Oh yes. Of course, copper pieces worked out of my hand for ten years.

Lage: Again? I didn't--.

Hedgpeth: Well, this thing has a copper jacket, too.

Lage: Oh, the dynamite?

Hedgpeth: Pieces.

Lage: And they got imbedded in your hand?

Hedgpeth: Yes. They couldn't get them all out. One thing, they didn't want to keep me under too long.

Lage: So the copper would work its way out?

Hedgpeth: Right.

Lage: Did it make you a more careful person?

Hedgpeth: I suppose.

Lage: It must have horrified your mother.

Hedgpeth: Oh, yes; it was pretty hard on her.

Lage: Do you think it made her more protective?

Hedgpeth: Well, she was afraid of that, so what she did was send me off to a military academy for a year and a half.

Lage: That was in response to your accident, do you think?

Hedgpeth: Yes.

Lage: To keep you out of trouble?

Hedgpeth: Also, the other thing was I had missed a year of school.

Lage: From your recovery time?

Hedgpeth: No. Because we lived up there through the winter.

Lage: Oh, so there really was no school.

Hedgpeth: There was no school. I think we went down the first year. Let's see, 1921 was the year of my grandfather's death, so that

ended the big Christmases at home. One of my aunts married a Nasburg, one of the old pioneer families in Marshfield, as they still want to call it up there.

Lage: Up in Oregon?

Hedgpeth: Coos Bay. The Nasburgs were one of the founding settlers of that part of Oregon.

Lage: Did your aunt marry after your grandfather died or before?

Hedgpeth: Before, because a picture of my grandfather's eightieth birthday shows--. I guess we were all born by that time. Six of us. The trouble is the youngest one, Bud, got hysterical and they carted him away so I don't think he got into one of the pictures. It was a very hot afternoon; everybody was dressed up in their finery. It was worse than waiting to be mugged for the county jail as far as I could see.

Lage: But look how much we enjoy those old pictures.

Hedgpeth: Yes, I know.

Father's Tenuous Tie to the IWW

Lage: One thing you mentioned in that article I wanted to ask you about was something about finding your father's IWW [International Workers of the World] card.

Hedgpeth: Oh, that was when we had the donkeys, yes.

Lage: Now, what was that all about and what does it show about your father?

Hedgpeth: Well, my father was not very sophisticated and, of course, he didn't know too much about the IWW. I don't think I ever saw him reading a newspaper, come to think of it. He would read the Bible or try Emerson or Thoreau once in a while. But interestingly enough, he had as a teacher the man who became his own brother-in-law. But heavens, how much older he was than my Aunt Carrie I don't know. [Caroline Elizabeth Hedgpeth married Aaron Frederick. --JWH] But he was a schoolteacher to a lot of these people including my father's first cousin, George, who remembered him very well.

Lage: Would this have been in Whisky Creek?

Hedgpeth: No, that would be down in Academy and Clovis, that area. They moved up, followed my grandfather up to the Whisky Creek area later.

Lage: I see.

Hedgpeth: Anyway, this fellow was an old school master from Pennsylvania and I think he was already about finished with his career when he turned up here. He was one of the first teachers at Academy. His name was Aaron W. Frederick.

Apparently, in his later years he went up to Oregon, because they hired people in these mountain schools that were long past age limits of any kind. He didn't do much but read poetry to the kids when they were young, so my father may have heard some of that sort of thing. I don't think he got beyond the fifth grade.

Lage: He didn't necessarily keep up with current events?

Hedgpeth: No. He was apprenticed to a blacksmith. He called him a blasphemous old Welshman.

Lage: The blacksmith was?

Hedgpeth: Yes. He obviously knew tricks of the trade that went way back before our days, and he taught them to my father.

Anyway, the IWW card is a very heavy thing and kind of shiny outside and red, white and blue with a screaming eagle on it. It looked like something similar to the old passes they used to give out to constituents in Washington when they were attending a session of Congress.

Lage: That's ironic.

Hedgpeth: Yes, it's a very similar looking thing.

Lage: You discovered this and you said it created kind of a ruckus in the family?

Hedgpeth: I asked my mother what it was, it looked so pretty. She knew what it was. As soon as he got back, she laced him up and down with, "You dangerous radical. You're contributing to that sort of thing." So it disappeared from the scene.

Lage: Was your father very committed to it?

Hedgpeth: No, I don't think he was very active. He just didn't know what it was. It seemed like a good idea to him, that was all.

Lage: Maybe he thought it was a pretty card also.

Hedgpeth: He didn't read the papers. He didn't know about burning the hay fields and all that kind of stuff they were doing. Of course, down here in Petaluma, there was a banquet for the twenty-fifth anniversary or twentieth, I guess it was, of the Bodega Head fight; all the Berkeley radicals were there. I told them my father had been a card-carrying member of the IWW. That brought down the house. [laughter] Of course, that was stretching it a little too, but I thought I might as well make something of it.

It wasn't that long after the PG&E tried to find out anything about me.

Lage: They could have used that against you?

Hedgpeth: In fact, they tried that stuff on Dave Pesonen. His father was a radical activist. I don't think he was a member of the Communist Party or anything, but he and the Associated Farmers didn't get along very well. Pesonen was active in the Unitarian Church. He wrote a wonderful piece about all the other values that should be observed in water, in our rivers and streams, for the governor's 1945 water conference. It's published in the back.

Lage: David's father wrote this?

Hedgpeth: Yes. I asked Dave, "Did your father write this kind of stuff?" He said, "I didn't know about that particular one, but I wouldn't put it past him." I found that thing very useful for me because that's where Governor Warren said the same thing Joe Stalin said, just about.

Lage: At this governor's conference?

Hedgpeth: This is 1945, the governor's conference on water.

Lage: And what did Earl Warren say?

Hedgpeth: Earl Warren said, "We should not rest until we put every drop of water in California to work." Stalin said, "We must not allow any water to reach the sea." I've used that several times.

Lage: What did Dave Pesonen's father say?

Hedgpeth: Well, they were libertarian and environmentally oriented sort of things which were not very popular then. He was asking us not to forget the fish.

Lage: And he worked for the Bureau of Reclamation, as I remember.

Hedgpeth: Yes. But he made these statements speaking in behalf of the Unitarian Church. He wasn't on the official program. I think he wrote a letter which was printed in the back of the report.

Solitary Time in Nature

Lage: Maybe I'm being too teleological here, but did the mountain experience turn you into a scientist in any way, or a naturalist or an environmentalist? How might it have?

Hedgpeth: Well, breathing the flowers like Ferdinand [the Bull]. I also had many pleasant hours seated by lovely little springs they had in the mountains. A lot of these springs are boxed to make them easy to dip water out of them. They come from little small rivulets or actually lowland places. They are all full of nice, charming, interesting bugs paddling around in them. Beetles of various sorts and that sort of thing.

Lage: Did you have a lot of solitary time?

Hedgpeth: Well, I was mostly by myself.

Lage: That probably had its impact.

Hedgpeth: Yes. There was a big oak tree with lovely acorns, great big fat ones with a golden kind of powder on the cup. I don't know if that was *Quercus chryssolepis*, or which one. I'm not a scholar of oak trees, and we have quite a few in California, I know, three of them in plain sight of this house. One there, one over there. There's a scrub oak, a black oak and I don't know what. I think there is another one down the road, a great big-leaved one. Those are natives. This particular area has been planted over with conifers by some fellow. One day we found our roof leaking. A large limb had been broken off by the wind and floated fifty to sixty feet like a falling feather, and punched a hole in our roof.

##

Hedgpeth: The fir breaks off that way; it comes down like a feather. You watch a feather fall; it sort of turns around on the nib. The branch happened the same way. This guy next door is an insurance broker and said, "That's one of your trees." I said, "We have six species of conifer right here and the only Douglas fir is the one on your side of the fence."

Well, anyway. Of course, he claimed it was an act of God.

Lage: So who won?

Hedgpeth: God. [Laughter] He cut down his fir tree a short time after.

II FORMAL EDUCATION, ELEMENTARY SCHOOL THROUGH THE UNIVERSITY

Public Schools, Homes, and Family in Stockton and the Bay Area

Lage: Okay. We are going to get you into the educational system. We are moving you right along. You went to Palo Alto Military Academy.

Hedgpeth: Well, if you want to go back to the beginning. You see, I was born on the 29th of September, so when I turned five years old I was not eligible to go to first grade until I was nearly as old as a second grader. We were living in this place called Clipper Gap, about five miles north of Auburn on I-80. It consisted of about six family groups and the store and the school. I don't think there was a church there. We boarded the school teacher--we lived right across the road. I remember the kids were all older than me, talking about starting school, asked me what I was going to do. I had never even thought of it; it had never even been mentioned to me, as a matter of fact. About that time I was reading funny papers with some idea of what they were all about.

So I trotted off, more or less followed the teacher I guess, presented myself in the lineup. She said I couldn't attend. I would have to go and play by myself for a while. I couldn't be in the school.

Years later, I talked to her. She had never lived very far from Sacramento. I think she was born in Sacramento and I think she died there. I lost track of her. She was pretty old when I caught up with her.

Lage: You looked her up?

Hedgpeth: My mother corresponded with people and after her death, I found all kinds of addresses of people I didn't even know she knew.

So I had to go around and tell them, wrote them letters, that sort of thing. I looked up Miss Flower. Her name was Enola Flower. I think it was her first school. I told her I still remembered that. She said, well, she had made a lot of mistakes in her life of teaching but she wasn't sure that was one of them. She gave me a book, a history of California, she had written for the lower grades. I didn't see her again. I was up in Oregon at the time. She got quite a write-up in the paper once about her career as a teacher, so she was fairly well known. The schoolhouse is still there. Our house burned down and there's nothing else left of Clipper Gap. Highway 80 wiped it out, including my father's shop.

Anyhow, we came down from the hills to Stockton. My father's blacksmith business hadn't panned out so he sold it out or just abandoned it; I don't know which. He got a job at the Holt Manufacturing Company. That was probably 1917 or early 1918. My first school was the big red house, a brick school that is still standing in Stockton--Lincoln School. Holt had a contract with the British Army to make tanks. That was a big event in the history of the Holt factory.¹

My father was working at a big steam hammer bending sheets of heavy steel.

Lage: Not quite the same as his blacksmith work.

Hedgpeth: Well, he made pretty good money at it, I guess.

Lage: How long were you there in Stockton?

Hedgpeth: We were there through Armistice Day. I remember the armistice parade very well, dragging Kaiser Bill's effigy behind the car. One of them was tied to the front of the car, and another was dragged behind.

Lage: So they really personalized it.

Hedgpeth: Oh yes. Kaiser Bill and all that.

I remember also the influenza plague. We all had to wear white masks.

Lage: That came right after the war.

¹Benjamin Holt. *The Story of the Caterpillar Tractor*. General Editor Walter A. Payne. University of the Pacific, Stockton, 1982.

Hedgpeth: Yes. Then, coming on to late 1919-1920, we moved back to the big house for a while.

Lage: You went to school in Oakland.

Hedgpeth: Yes. My father worked in the Alameda shipyards, also finishing off a war contract. They were building cargo ships there in the Moore Shipyards. The Moores were old family friends of my mother's and the McGraws in general. The Moores and the Rolfs in San Francisco in the old days. Right after that, we went to Hetch Hetchy where my father disappeared from the scene for a while. We lived in Berkeley for a while and I attended second grade there.

The big house in Oakland was built about 1886, I think it was. My [grand]father got a relatively new house, built by Dr. Cole. My grandfather bought it in 1889. That kind of information I got out of the Oakland library's Oakland history room. In fact, I submitted a dossier on the house and the family to Bill Sturm there.

Lage: Did you mention that it had been lifted up and turned 180 degrees?

Hedgpeth: I think so.

Lage: That's a fascinating thought.

Hedgpeth: My aunts always delighted in telling me that. You can tell it from the address in the city directories. The first address of the house is on Adeline Street. I think it turns out that the address then becomes Chestnut at the time my [grand]father bought it, so he probably had the house turned around. That's why my aunts remembered so well.

Lage: You say you lived in Berkeley. Did you go to school when you were in Berkeley?

Hedgpeth: Yes.

Lage: Which school did you go to there?

Hedgpeth: It was Lincoln.

Lage: Did you live in the south end or the north end of Berkeley?

Hedgpeth: I lived down there in the south end where Adeline, Ashby, and Grove all come together there. And Shattuck. The house I think is still there. We lived on Fairview, which is a funny little

street which didn't come through. We found an Indian burial site in the back yard. We were digging around, as kids. A skull...we kept the skull for years. It finally fell down. We used to carry it around on Halloween. It broke. The Indians would have lynched me if they knew all that stuff. And a whole lot of arrow points and other things that we didn't know the significance of. I don't think any of the arrow points I have now are part of that at all. I think those all got lost.

My cousin, who lived in Lafayette, found a great big ceremonial point about seven inches long. He gave me all that stuff; he had no interest in that. They had a beautiful dragoon pistol of 1840 vintage which they ruined by trying to fire it and putting too much powder in it. They blasted off the cap holder and all that stuff. It was a lovely, big pistol.

Lage: Which cousin was this?

Hedgpeth: Ed Rowland, my oldest cousin on my mother's side. He was the first born of our generation. He was about six years older than me.

Lage: So you became the repository of these kind of family things, because of your interest?

Hedgpeth: Well, no, not really. What happened was that his mother, one of our aunts, built an antique house out next to the garage and put in it all the heirlooms, including the appointment of my great-grandfather as postmaster of Port Orford signed by Abraham Lincoln and all that kind of stuff. It all went up in smoke.

Lage: It all burned down.

Hedgpeth: My dear cousin came home one evening, not in complete command of his faculties, and tossed a cigarette or something. Anyway, it all burned down. Whatever was left was in the attic, just shards and things. A couple of pieces here characteristic of the kind of stuff that gets kicked around. [Goes off to get something] This came from his attic.

Lage: What are they?

Hedgpeth: Fids.

Lage: Fids? F-I-D?

Hedgpeth: Yes. Fids are for working ropes, working out knots and for splicing. These are Eskimo, of course. That's fossil ivory; the new ivory one was probably made by a white man. It's been

turned on a lathe to make that symmetrical a head. This is probably Indian work. This is so-called recently dead walrus.

Lage: What is this that I'm playing with here?

Hedgpeth: That is one of my mother's souvenirs. That is a purse, an Indian purse. This is deerhorn, antler horn, and it was designed to hold those things. Those are *Dentalium* which is a scaphopod mollusk shell, and they used that as money.

Lage: This is the money and this was the way they kept it.

Hedgpeth: And they wrapped a piece of sinew around to keep things in there.

Lage: What a treasure that is. So this was something your mother--.

Hedgpeth: Yes. It comes from the Hoopa Valley. One of my aunts went up to southeast Alaska who taught Indians, the Haidu.

Lage: Then you had another aunt interested in teaching Indians?

Hedgpeth: Well, several of them tried to teach in missionary work.

Lage: Look at this. Is that abalone?

Hedgpeth: Yes. The very interesting thing about that is it has been in the family for about eighty or ninety years now. I guess my Aunt Edna had it there. That's what she brought back. She brought back some other carving that went to her nieces. This was left in the house. It got split some time.

But you notice that abalone? I got a strange letter from the museum of Victoria, British Columbia, wanting to know if I knew why the abalone in the Indian carvings was turning white and if there was any way to stop it. The lady was writing to me because she knew I was a director of a marine laboratory and wanted to know, since one of the authorities on the mollusk shell was a man named Alex Comfort, whether he was still in this business. I wrote back, "The problem is, I have been up to Victoria, and you have these in air-conditioned, permanently controlled protective cages and boxes. You are taking the water out of the shell, and it is the water in this shell that does that."

Lage: The water gives it its color?

Hedgpeth: "So preserving them in those air-conditioned boxes is ruining them," I said. "We had this one in the family for eighty years, and the abalone eyes are unchanged."

Lage: Did you know that quality about the shell, that the color came from the moisture?

Hedgpeth: Yes. A lot of it does, the iridescence. Of course, as for her question about Alex Comfort, I couldn't resist pointing out that he had gone into another business--writing do-it-yourself manuals for the bedroom. [laughter]

Lage: This is the same Alex Comfort?

Hedgpeth: Yes, of course it is.

Lage: How interesting. Did you know him in his former life?

Hedgpeth: I didn't know him, but I think in one of those books, there is a little prefatory statement, or maybe it was on the flyleaf somewhere, it said this.

Lage: Now, we had you living in Berkeley; then we were going on to your next--.

Hedgpeth: Berkeley, yes. Then the next school I went to, I guess, was in Alameda.

Lage: Did this have an effect? Changing so rapidly from one school to another?

Hedgpeth: Well, I never knew any teacher very well. None that helped too much. In Alameda, I guess Dad was still working in a shipyard. He moved over to Alameda to get away from 929. It was a little further away, I guess.

Lage: Do you think your father was restless in the old home?

Hedgpeth: I don't know. Maybe my mother was restless. That was 1919.

[I should have remembered something that has always been with me: one evening around 1920 when my father was jobless, he had set up a crude drafting table in a remote back room in the attic, and I asked him what he was doing. He said he was designing a pump system to deliver gasoline to automobiles that would register the amount of gas involved. It sounded practical to me (gas stations were in their beginning then). They were nice looking drawings. Then I went down the stairs from the attic room to the warm fireside of the upstairs sitting room.

My mother and several aunts and George Wightman, my aunt Spud's adopted son (an orphan from her first school assignment, the orphanage at Tiburon) were there. They had been talking about my father being out of work and what he was going to do (it must have been just after the shipyards had closed--I was going on towards nine). One of my aunts asked where he was and what he was doing, and I said he was designing a measuring pump for gasoline. George Wightman immediately remarked that that had already been done. I was ordered by one of my aunts (my mother did not say anything that I remember) to go back upstairs to tell him not to waste his time. It was a long slow way up those stairs. All my father said when I told him was, "Is that so?" By morning the plans had disappeared and the matter was never mentioned again. I did not remember it again until only about ten years ago, until it came back to me and I realized it was a cruel thing to ask a boy to tell his father.

It was to be many years, indeed to his last illness in the King's Daughters Home on Broadway in Oakland that was founded by the order where my mother was an active member, that my aunts who were left began to visit him. Aunt Spud took it upon herself to visit him regularly and he died there. George Wightman had died long before--he never worked out as an adopted son.

The last time I saw my father was at a nursing home in Walnut Creek. He asked me to take his tools to the shop. (He had borrowed a 200-pound anvil from Machado--the last blacksmith in Walnut Creek.) I knew I would not see him again (I was at Scripps in La Jolla then).

My mother was at home with a companion to care for her. She insisted on walking out to my car and watch me drive away, and she died not long after.

After they were gone, the world belonged to me.]¹

[In Alameda] I remember a silly little episode; we were standing in a vacant lot, and all the kids began to scream and run away. What were they doing? I should get out of there, because there was a dragonfly that would sew up my mouth if I kept standing around there.

Lage: This is what they said?

¹Mr. Hedgpeth added the preceding bracketed material during his review of the draft transcript, and included a poem *In Memoriam* to his father. See following page.

In Memoriam (Joel Hedgpeth, 1875-1956)

A rusted wagon tire,
relic of some forgotten smithy,
half-buried and tilted from the ground
to mark a neighbor's entrance way
reminds me to remember seventy years ago
my father's ancient single-handed skill
as men came to stand around and watch:
he brought the red-hot circle
of shrinking iron against the felloes
and tightened it by turning in the tub
with the quickness that was the essence of the task.

From hundreds of years before
this art of celtic smiths
had been handed down to him
by a blasphemous old Welsh blacksmith,
my father said his name was Morgan.
I was there that day it ended,
as the watchers came in motor cars
on rubber tires at the time beginning
of our age of motor poisoned air.

My mother never wanted me
to put it down on the forms from school
that he was a blacksmith
but instead to write "machinist."
I would not do it - I never could forget
how his hammer shaped white to red hot iron
on his sounding anvil.
It would not be until long after and he was gone,
that I learned he had been known in his time
as the best man with iron in the valley.

Joel W. Hedgpeth

POETRY WALES

Cylchgrawn Cenedlaethol o Farddoniadaeth Newydd

Editor Meic Stephens

VOLUME FOUR SPRING 1969 NUMBER THREE

Poem by Joel Hedgpeth,
inspired by his
Welsh heritage and the
cemetery of the
Welsh mining town of
Somerville, now
part of a regional park in
Contra Costa
County, California.

24

Epitaph at Somerville

Mewn bedd o dan gudd-mewn arch o goed
Allan nis gellir fy ngar fod.
Na dyn byw fy nwys adriabod.
Nol cau fy medd ond cof fy mod.

Boxed in boards, buried here below,
From where I can no longer see,
No living one may learn my woe:
Come close my grave, remember me.
(Transl J.H., 1994)

A hundred years now gone
John Williams of Llansabon
Lived and worked here in the mines.
Praised the fine Welsh spoken here
And wrote of that arid year
In his letter home to Wales:
How they welcomed with their smiles
The rain that ended the drought
In this valley far from home.
How they lived their hours out
On Sunday with their sermons
First in English, then in Welsh.
And how they learned their lessons.
"For if a man has nothing
To raise him he will seek out
The things that are degrading."

So John Williams wrote back home
From this forgotten valley
Where no houses stand today
In these hills above the mine.
Where no voices speak the tongue
Once alive and cherished here.

The living grass grows lightly green
Beyond the high and barren hill
In this time abandoned place
Where the battered headstones
Plead for paradise and peace
In a language long unheard
For lives now unremembered.

Anguish faded from these graves
Quietly as growing leaves
On the young stems of the year.

25

Our green remembrance holds
A wingbeat stance of startled bird.
Time's sequence reconciled
Within an interval now heard
By innerness of mind:
Our moodily sunlit presence
Lost in quietness whence
Grass and flowers of the year
And ourselves may end.

JOEL HEDGPETH

John Williams' letter of November 29, 1864
is published (in English) in *The Welsh in
America-Letters from the Immigrants*, edited
by Alan Conway, University of Minnesota Pres:
1961, pp. 266-267

The names on the headstone above the epitaph
are:

In Memory of

JOHN RICHARDS
Born in South Wales
Died Aug. 4, 1874
Aged 30 years

WILLIAM TIMOTHY
son of

John and Mary Richards
Died June 2, 1874
Age 17 months.

Hedgpeth: Yes. I didn't believe that. There were a lot of dragonflies flitting around; they never came close enough to do anything. So I just stood my ground and they all disappeared. Why I should remember such a silly little episode as that?

Anyhow, the chief thing there, that was the last time I saw my father's father. He stayed overnight with us, he and my grandmother. My grandmother was blind. That's on the Hedgpeth side, of course. They had brought me a lizard in one of these big, old house match boxes.

Lage: That was a big gift for a boy your age.

Hedgpeth: I reached for it. Grandma grabbed it because she was afraid I would let the thing loose, and she killed it in the process. Which was too bad, very sad. Anyway, the next morning, before I woke up, my grandfather had gone on to Oregon. I never saw him again.

I never saw my grandmother again either. She came from a very distinguished line, which I didn't know about at that time. She was a Brearley. She was descended from the signer of the Constitution from New Jersey, I think. Or was it that that was her great-great uncle. One of the Brearleys, or both of them, were officers in the Revolution, in the Continental Army. That's a fairly old family, a fairly rare name. It's a very strange thing that happened in Oregon, which was that there was both a Tichenor and a Brearley on the faculty at Oregon State, but neither of them were closely related.

Lage: When you went to Oregon State there was a Brearley and a Tichenor?

Hedgpeth: Well, the Brearley turned up later. I immediately phoned him, to know who he was. He came from a Canadian branch of the family, had nothing to do--.

Lage: And the Tichenor wasn't related either?

Hedgpeth: Wasn't related either. Those Tichenors were all over Oregon.

[interruption for phone call]

Hedgpeth: Well, the city of Santa Rosa wants to build a pathway along the Santa Rosa Creek. Back about 1964, the city of Santa Rosa, the [Luther] Burbank House--do you know this town well enough to know where the Burbank House is? Burbank's place used to border on the creek. They put all that underground--.

Lage: They moved the creek underground?

Hedgpeth: Yes. They put in a big culvert, and they built city hall on top of the culvert. I publicly stated that I was not anxious to promote this business, at least until they blow up the city hall and get rid of the culvert, because that was a site locality of what is now the endangered shrimp, *Syncaris pacifica*. Somebody else a while ago said they ought to blow up the city hall too, but I think he had architectural objections. It doesn't look very good. I have characterized it as having been poured into forms made out of old piano boxes.

Lage: So you are advocating IWW tactics here?

Hedgpeth: I fear so. I am not the only one apparently who doesn't like city hall architecturally.

Lage: Or environmentally, it sounds like.

Hedgpeth: Yes. The contents of the city hall especially [laughter]. This guy said they want to condemn a big hunk of his land, take about twenty-five acres. He's got a piece of property, and I guess it straddles a creek somewhere out west in the pastureland.

Lage: They want to take it to build a path?

Hedgpeth: Yes. They've got to do something. They want to spend something like \$50 million dollars or some crazy sum of money. I don't know where that money will come from or what it will be spent for. One of the things they've got to do to rehabilitate that creek--- One of the main branches, Brush Creek, runs along this road. One mile of it is a straight line. Nature abhors straight lines in streams.

Lage: That isn't a natural stream.

Hedgpeth: All you've got is a culvert. Well, anyway, that's what that was all about. I'll go out to see what his problem is.

Lage: Let's see if we can get your education taken care of to feel like we've really accomplished something here. We were in Alameda. You were there a short time, it sounds like.

Hedgpeth: Yes.

Lage: And then, the mountains in 1921.

Hedgpeth: Yes. Then we went back to the mountains, to Mather, Tuolumne County.



Joel W. Hedgpeth, ca. 1922.

Photograph courtesy of Joel W. Hedgpeth

Lage: Where you really didn't go to school.

Palo Alto Military Academy, 1922

Hedgpeth: Right. Then I went back to the [Palo Alto] Military Academy [in 1922]. I did very well there, I gather. Of course, you have to weigh these things a bit because military academies are commercial enterprises and they want to have us little dears as long as we can be paid for. I'm not aware that they ever flunked anybody out. But I was bemused because I found this letter to my mother from the headmaster, who called himself "colonel" of course; I don't know what his real army rank was. He might really have been a colonel for all I know, but everybody had a military title there. He wrote this letter to my mother saying what a nice influence I had been on the other little boys.

Lage: What do you think he was referring to there?

Hedgpeth: I don't know, because I remember one time I had been accidentally pushed into the swimming pool. No great harm about that, but I had an old dollar watch and it got wet, so it wouldn't run. This other kid had this cigar box of postage stamps. Of course, we were all collecting in those days. We arranged a trade. He got back to his room, and he found the watch wouldn't run. I got back to my room and found that there were no triangles that I had seen at the top of the heap in this collection of stamps.

Lage: You both cheated each other. [laughter]

Hedgpeth: So there were mutual recriminations, and an order went out that trading was not to be conducted except on Saturday afternoons in the presence of one of the presiding teachers or officers.

Lage: Anything academically from that experience? You must have been very young. Eleven years old?

Hedgpeth: We had to memorize "The Charge of the Light Brigade" and so on. Of course, the other thing I did was bop a kid over the head with a sack of marbles I had won from him--he claimed I had cheated him--so we were not allowed to play marbles for keeps. I had to walk track for that one. Instead of being free on a Saturday afternoon to go to the five and dime movie downtown, I had to walk around the racetrack with a wooden gun for hours.

Lage: Holding a wooden gun?

Hedgpeth: Yes. In the military, as punishment you got so many demerits for this sort of thing--if your hands weren't washed in the morning or if your necktie wasn't straight, among other such things.

Lage: That was a long way from Mather.

Hedgpeth: Yes. This was when I really lost interest in organizations. It was a ghastly Sunday afternoon and I wasn't feeling too well. They served creamed cauliflower, a dish I wasn't too fond of. I asked to be excused. Major So-and-so was presiding over us. "Eat up your cauliflower." So I ate up my cauliflower. "Here, eat up some more." He gave me a great big plateful of the damn stuff. "Eat all that." I got it all down. Fortunately there was a thicket of bamboo just outside the door. I headed for that and managed to get rid of most of that cauliflower. I've never been able to eat cauliflower since.

Lage: It sounds a little sadistic.

Hedgpeth: I think it was, but anyhow. Also, I've never remade my bed so that I could bounce a nickel off of it since.

Lage: Then your mother took you out of that academy.

Hedgpeth: I think she ran out of money.

Lage: It wasn't because you didn't like it.

Hedgpeth: Well, I didn't have much to say about that. They wanted to make a little man of me. That's what they told her it was doing. So, back in the public school, I discovered I was now back in step with my age class.

Junior High and High School in Oakland

Lage: That's when you went to San Leandro.

Hedgpeth: We were there through high school, so we were there for about six or seven years.

Lage: That was the most stable.

Hedgpeth: Well, my father took to working away in other parts of the state. He worked for quite a while in Pleasanton, out there in the sticks.

Lage: Did your mother have a little business, did you say?

Hedgpeth: Yes, she ran a little dry goods store for a while. It didn't do very well. It wasn't a very good neighborhood for it for one thing.

##

Lage: You said you went to Fremont High School. Was that in Oakland or San Leandro?

Hedgpeth: First I went to junior high, Lockwood. San Leandro at that time had no junior highs or high schools. When it came time, we had the option of going to either Fremont in Oakland or Hayward. Hayward seemed a long way out. Fremont was fairly close, about twenty minutes. You see, the big, red train ended right near where we lived in San Leandro. It went all the way down to the ferry landing, big Southern Pacific red train. They ran right on Seventh Street in Oakland, clear to the ferry landing. They would stop a block from Fremont. That was pretty easy.

For the first year, I had to go to Lockwood. I had about a mile and a quarter to walk from where we were. We were in the Broadmoor district of San Leandro. We would go down to East 14th to get the street car to go to Lockwood.

Lage: That was in Oakland too?

Hedgpeth: Yes. The only thing I remember about Lockwood was that I had an interview with the administration for having drawn up a cartoon of a cigarette oozing smoke, shaped like a skull and crossbones. I labeled it "The Curse of the Nation" and stuck it on the bulletin board. I was told this was an unauthorized thing. I hadn't gotten permission and they didn't like this kind of conduct, so forth and so on.

Lage: What made you think it was the curse of the nation at that point?

Hedgpeth: I don't know why I did that or anything. All I remember was having done it and then being reprimanded by the principal and the vice principal.

Lage: But you don't remember where your feelings about cigarettes came from?

Hedgpeth: No.

Lage: Surely there wasn't the health concern there is now?

Hedgpeth: No. Of course, up in the mountains I had smoked coffee.

Lage: Coffee!

Hedgpeth: Well, I made a pipe. There's a picture of me, with a piece of plumbing, a small-diameter elbow and the nozzle from a big oil can.

Lage: And you put coffee in it. Ground coffee?

Hedgpeth: Yes. My mother was an inveterate coffee--. She couldn't survive without her morning coffee. Anyhow, that was Lockwood. Then I went to Fremont for three years [graduated 1929].

Lage: Were you thinking about going to a university after that? Was this a goal?

Hedgpeth: I wasn't thinking about that. It was expected that I would do that.

Lage: I see. That was the goal in the family, or your mother, at least.

Hedgpeth: My eldest cousin, he was sent to a military academy too when he was young. He was sent over to San Rafael; I don't know why, except they lived out in Orinda in the Walnut Creek area and there wasn't as much in schools in those days out in that part of the woods. I think he got through high school but I'm not sure. My other male cousin, Jack, pulled out after a year or two. He was a Bigelow so he was rushed for a frat. He wanted to be a chemist but he wasn't cutting the mustard, I don't think, so he pulled out.

Lage: Pulled out of college?

Hedgpeth: Yes. So my other two cousins, the girls, I guess they both went through college. One of them was what you would call legally blind most of her life. Both of her parents were devout Christian Scientists. After they died, she had an operation so she can read a little now. That impressed me, a rather sad affair. So I'm the only one who made anything out of an education.

Lage: Of all your mother's relatives. What kind of a school was Fremont? Were there any teachers there that made an impact on you or any scientific studies that helped direct your interests?

Hedgpeth: Fremont was a big, city high school. By that time, I don't know how it had happened, I obviously knew more biology than the biology teacher.

Lage: Just from learning on your own.

Hedgpeth: Yes. Then my English teachers encouraged me to read things like *Vanity Fair*. [I was also writing for the school paper; in my senior year I was associate editor of the school paper, the "Green and Gold." I wrote editorials and a column.

Perhaps the greatest influence on my writing was the letter I got from my aunt Edna in Oregon. She wrote: "I hear you are writing for the school paper. Whatever you do, don't become another Ambrose Bierce." She underlined the last words three times. My immediate reaction was to look up Ambrose Bierce in the library.

After my aunt's advice about Ambrose Bierce, I gobbled up things like "Black Beetles in Amber," and made a left-handed acknowledgement to his influence by the remark about my alter ego Jerome being possibly "a natural son of Ambrose Bierce." As for writing verse, that is a gift from my mother--she was the poet of the family.]¹

My mathematics experience wasn't very good. You see, I've always had hearing out of one ear only. So I didn't hear too well in a lot of classes. Anyway, I never did very well in math. In Fremont, they had a very interesting math teacher named Albrecht who was actually a professional engineer. Very early on, he was greatly distressed about the lack of competence in mathematics he was seeing in the young people around him. He turned himself into a high school math teacher, and he was very good at it. But the counselors always reserved for him the kids that were doing good at math and steered us others away.

Lage: So he just got the top-notch kids.

Hedgpeth: Yes. He had them into calculus before they had graduated high school.

¹Mr. Hedgpeth added the preceding bracketed material during his review of the draft transcript.

Lage: Did you not get to study with him?

Hedgpeth: No. The counselor never thought of sending me to Mr. Albrecht, but ordered me to drop the chess club instead.

A Summer Idyll

Hedgpeth: The summer after graduation from high school left many of us with nothing much to do until the university required us to appear on the scene. Somehow, in a manner I cannot remember, DeWitt Briley and I started correspondence. I lived in San Leandro near the end of the big red SP [Southern Pacific] commuting cars that connected with the bay ferry to San Francisco, and he lived in a hillside house above the cemetery just south of Mills College some several miles distant. In a brief time there somehow became eight of us, gathering for hikes or visiting around, although De's house was our regular meeting place. De was the brightest of us, reading *Thus Spake Zarathustra* [Fredrich Nietzsche] and Schopenhauer, but he was not a member of the graduating class but of the next semester, out of phase. We had philosophical conversations and called ourselves the Sophists. Several times we were all invited to dinner by Mrs. Briley, a lovely red-headed Irish woman, who obviously enjoyed all of us--De was her only child.

De got a job after he graduated in December, and did not enter the university until the fall of 1930, so he was a member of UC '34. We had hardly realized that we were on the same campus again when he contracted appendicitis. They waited too long, and his appendix burst, his lungs became infected, and after a sad illness he died. He wanted my blood, because he knew I did not get easily infected, but it was the wrong type.

I suppose it was Mrs. Briley who asked us to be pallbearers, and I remember looking up from the grave toward their house on the hillside. His mother took sick and died soon after, and his abandoned father, an operator of a locomotive in the railroad yards, mourned himself to death as well. A neighbor went to see him and found him lying on the floor, crying.

The Sophists went their way, and I never heard of most of them again, although I remained friends of one of them all his life. One of us, Reno Cole, majored in physics, and I did not hear about him again until I read his obituary in the *University of California Chronicle* and learned that he had become a popular and devoted professor of Engineering at UCLA.

De had suggested that we adopt as our motto: "If you have but two loaves of bread, sell one and buy a lily." He was the brightest of all of us, and it saddens me even to think of his loss after sixty-three years. I still have his copy of *Thus Spake Zarathustra.*] ["A Summer Idyll" was added by JWH in October, 1995.]

San Mateo Junior College, 1929-1931

Hedgpeth: This teacher I had in high school would never explain why I just got the wrong answers. So I went on to junior college (I was not recommended for college because I was making torpedoes to put on tracks that would blow up--my accident hadn't really cured me of fooling around, I guess).

Lage: It didn't cure you?

Hedgpeth: Anyway, I was making explosive objects.

Lage: It was your behavior that got you not recommended?

Hedgpeth: Well, they didn't recommend me for college, so I had to go to junior college [San Mateo Junior College, 1929-1931], and transfer.

Lage: How difficult was it to get into the university from high school?

Hedgpeth: Not very. All you had to have was a recommendation and your transcript.

Lage: Your principal had to recommend you.

Hedgpeth: He would recommend you, and all you had to do was take Subject A, which was simply an examination. Subject A, writing five hundred words of drivel. As long as it was grammatically correct, they passed you. I did take that exam.

I was reading all kinds of stuff. My grandfather had given me books about bugs and things. At least, my aunts told me he had. I'm not sure he did because he was getting blind toward the time I knew him. He couldn't read very much any more.

Lage: Where did you learn all your biology, when you said you knew more biology than the biology teacher?

Hedgpeth: That was a way of saying she didn't know very much.

Lage: She didn't know much. You're not saying how much you knew.

Hedgpeth: No. I guess it was from the books and wandering alone in the mountains. So anyway, when I got down to junior college, when I was supposed to take trig, after the first problem paper... He came down the aisle and said to me in the presence of all, "What kind of math instruction have you had, anyhow?" "Why?" "You are a born transposer. Any competent math teacher could have told that in five minutes."

Lage: What? You transpose figures?

Hedgpeth: Yes, I do. I never try to remember phone numbers. I didn't know that. But after he told me that, I spotted it and I did a little better.

Lage: Did he help you overcome that or just pointed it out?

Hedgpeth: He just pointed it out to me and let me sink or swim with that. I got along with him all right; he passed me but that was that. That didn't give me too much faith in counseling, to say the least. The person who I got up there--I had a major advisor at Berkeley. I had a run-in with him too.

Lage: You spent two years at the junior college and then you went to Berkeley?

Hedgpeth: Then I transferred to Berkeley [class of 1933] and I went there for three years really. I had a graduate year.

Lage: When did you decide on your course of study?

Hedgpeth: I had started with the idea of becoming a journalist, but the instructor was not very bright, so I changed. While I was at junior college, I was working for the biology department. It was very easy to get grades in that subject, for me anyway.

Lage: Which subject is this?

Hedgpeth: Zoology, biology, all that sort of stuff. So for the second year, the instructor, who had a Ph.D.--he was a very good guy--had me hired as the flunky for the biology department. I would collect things for the class exercises and arrange stuff.

There was this gal who had gotten her Ph.D. from C. A. Kofoid. I don't know what she ever did. I looked her thesis up years later and found out it was absolutely practically nothing;

it was a little twenty-page, flimsy affair, "some stages in the life of a soil amoeba." But anyhow, she and I had run-ins. She had her niece in the class; that's bad business. Her niece wanted me to show her the gonads in the subject that they were dissecting, and I said, "You know where those are as well as I do." So the class was guffawing.

As I left there was Charlie Woodruff Wilson at the swinging doors of the lab, of all things, like a saloon, who said, "Creating a disturbance in my class!" She had glassy, watery eyes like something dead, and glared at me. I said, "No, just leaving in one." [laughter]

So anyway, that didn't matter, except to show the way things went in that place.

Lage: Was this at San Mateo Junior College?

Hedgpeth: Yes, sure. I think they were quite a refuge in those days for frustrated Ph.D.s, and maybe still are, I don't know.

Lage: Who didn't get positions that they might have preferred?

Hedgpeth: Yes. Of course, in the depression years, which were just starting then, it was pretty bad. If you got a good job in a junior college, you stayed with it, because you'd lost time anyway, and you'd have to--.

Lage: You went to San Mateo Junior College in '29, so this was right at the onset of the Depression.

Hedgpeth: Yes. Well, there were pretty good people there. We had a very good history teacher. He was one of these amateur cartoonists, and he liked to illustrate things like the Diet of Worms with literal bits of worms and things.

Lage: A history teacher, you say?

Hedgpeth: Yes. He was teaching European history.

Lage: Well, what was he doing with the Diet of Worms?

Hedgpeth: The Diet of Worms is one of the great conferences--[laughter]-- Diet is a council, Worms is a town in Germany. I can't remember what it was all about.

Lage: I can't jump between your biology and your history.

Hedgpeth: Oh, I agree. You have to take all these things at once in school, so you get mixed up at times, you know. So I got to Berkeley where I ran into the counseling ritual again, which there, of course, had a pretty rigorous set of requirements of certain courses. And then, the worst thing is the number of units. I wish they'd abolish that.

Lage: Did you get credit for all your San Mateo work?

Hedgpeth: Oh, yes. I took German from a nice old guy at San Mateo. He did pretty well. I think he was an old Swabian type. He certainly was Bavarian, at any rate. He told us a sad story about how he left Germany when he was a very small boy, his schoolmates serenaded him in the morning of his departure, singing, "Muss i denn." Strangely enough, one of the very first things I heard in Germany was that song. The train had stopped about 4 a.m. at a railroad station, and here was this guy getting on with two suitcases, and here were his friends and the school band serenading him with "Muss i denn, zum städtele naus." That was 1953. ["Must I go, away from this little town..."] [laughs] So I sent Professor Koehler a postcard and said, "You were right; they're still doing it." [laughter]

Lage: He was probably quite flattered that you remembered.

Hedgpeth: I remember him pretty well. He and I got along in a friendly way. Except one time when I had a cold and was deaf and couldn't quite hear him, and I flubbed up, and he said, "I expected better things of you, Hedgpeth." I never did tell him that I had a bad cold and couldn't hear him that day. [laughter]

Lage: The memories of these things come back so vividly.

Hedgpeth: Don't they?

Studies at UC Berkeley, Class of 1933

Hedgpeth: So when I got to the university, I had as advisor for a major in zoology a character lovingly known as J. Dogfish Daniel to the graduate students behind his back. He'd written a manual on the dissection of sharks, "The Elasmobranch Fishes," which was our dissection guide. We were given small sharks, about two feet long, but one day a basking shark about thirty feet long was brought into the LSB [Life Science Building] court and dumped onto a flower bed. Old Dogfish gave us an al fresco lecture on

the fine points of this fellow, ignoring the botany professor, who was bemoaning the destruction of his flower bed.

Professor Daniel's book was actually pretty good, but according to general rumors, if somebody brought in a shark and he couldn't identify it offhand, he had to go back to his own book and look it up and see which one it was. Those stories, you know, get around.

But I got tired of his suggestions that I take anthropology for another three units, and I had to fill out--you work out courses you absolutely had to have, were required and all this, and that you wanted. "Now, you have two more units this term. How about this course over in forestry? I understand it's not a very difficult course." So he put me down for fire control in the Department of Forestry, which was a crashing bore. We had to read government pamphlets on how to sight fire-finders and smell the air, and this kind of rubbish.

Lage: Didn't seem to have much connection with what you were studying, either.

Hedgpeth: No, it didn't. One fall I had to take another course in forestry which was useful, however; that was forest ecology. That was a very good course.

Lage: Who taught that?

Hedgpeth: Arthur W. Sampson. He was one of their great professors. We went out on excursions. I remember one we took on the slopes of Tamalpais in a freshly burned area. That guy used to be a two-miler when he was young, so he'd walk up the hill lecturing at us, and we were all winded by the time we got to the top, and then he'd start asking us questions about whether we'd noticed anything, and this or that--

Lage: [laughter] You were trying to get up the hill.

Hedgpeth: Yes, right. So anyway, he was a very good guy and a good lecturer. But this other thing was terrible, it was an absolute bore.

Then anthro--some of them were pretty good. I took a course in American Indians because of my mother's missionary experience and all the Indian artifacts we had around the house. About all this guy did was itemize which tribe used which kind of arrowhead, and which kind of baskets.

Lage: Do you remember who that was?

Hedgpeth: Yes, E. W. [Edward] Gifford. In fact, I thought he was an Indian. He looked like an Indian; I was told he wasn't. He didn't have any Indian blood, but he was of stocky build. The other part about anthro, that was before they had the great museum, and it was in an old corrugated tin building up there just below the Faculty Club. And in spring afternoons, that was a deadly place to take anything, because--

Lage: That's where they gave the courses?

Hedgpeth: Yes. So I came along; I wanted to sign up for English 106E, and my advisor said, "What's that?" I said, "It's a course in advanced composition, admission by instructor's approval, which you gain by submitting something you've written."

Lage: Dogfish didn't approve?

Hedgpeth: He didn't. He said, "I don't know what you want that course for." I said, "Well, the instructor has admitted me. I want to learn more about writing English." "I don't think that's necessary. Well--" so he grabbed a big stub pen and he scrawled his name on the approval card, without which you couldn't live then. So I took the course.

I didn't do too well; my best friend died that semester, and I was upset about that [see page 61]. I didn't produce quite enough--I'm not a rapid writer. I can't just gush out bushels of prose for people anyway.

English from George Stewart

Lage: Who taught that course?

Hedgpeth: George [R.] Stewart. I saw him years later. I had gotten on a first-name basis by then, and he was in the Bancroft Library with a collection of maps, poring over them. We got to talking. I said, "What happened to the other people in that course anyway?" He said, "I don't know; you're the only one I ever hear anything about, and I gave you the lowest grade." [laughter] I said, "Well, English wasn't my major." He wrote a book on garbage.

Lage: One of the others wrote a book on garbage?

Hedgpeth: No, Stewart.

Lage: I hadn't heard of that. *Fire, and Storm*, and--

Hedgpeth: Yes, he wrote one, called *Not So Rich as You Think*, and it was about the problems of garbage and disposal, and how it was really going to do us all in if we didn't do something about it. And of course, I had written about Bodega Head and other things by then, so I went and got a copy of this book on garbage, and I said, "I think you should sign this book." He had made a comment once that he could always count on me taking a dim view of things, when I'd written about the passing of the salmon or something like that--

Lage: He had said that?

Hedgpeth: Yes, he wrote a note acknowledging it. It was very well written. "I could always count on you to take a dim view of things." So anyway, [laughs] so he wrote, "A long time ago student and good fighter," on this one, and signed it, and that's the last time I saw him. Except I went to his memorial service, and I always kick myself for not getting up and saying something. He had retired twenty years before, and there wasn't anybody there who remembered him as a teacher. They were talking about his amateur theatricals, some of his later books--

Lage: What do you remember about him as a teacher? Did he make an impact on you?

Hedgpeth: Well, he was very good in his ways of correcting you or helping you out if you'd done something wrong. He wouldn't just say, "You stupid idiot," you know. But also, he taught us how to use sources and evaluate them. That was a very useful course for that purpose.

Lage: Did it help you with your writing?

Hedgpeth: Yes. And then he said my sentences already moved along in an easy fashion anyway.

I didn't realize it at the time, not until I picked up my daughter's eighth grade reader and I went through the ceiling. It was called *Adventures in Reading*, and it excerpts--it had all of "Hiawatha" and two sonnets from Shakespeare in it as poetry, and pieces from Mark Twain. I started reading, and it was "The Legend of Sleepy Hollow." I said, "There's something funny; this isn't right." So I grabbed--I have a set of Washington Irving--pulled it down, looked at it; they had deleted all his longer words, and skipped sentences and so forth.

Then I turned to Mark Twain, and they had spliced in parts of *Life on the Mississippi*, jumped about sixteen pages, spliced it in. It took me quite a while, of course, to find this out. And they'd even spliced one sentence from one page and the second part of it from another page.

Lage: They thought they could improve on it?

Hedgpeth: Yes. And the other thing that got me is in *Tom Sawyer*. It started out by, "Tom, get outen that bed afore you're too late for breakfast," or something. My father's people came from Missouri, and I think my father spoke with quite an accent before my mother rubbed most of it out of him, but he still had some of it. I said, "Nobody from Missouri ever spoke like that," and I looked it up, and I found it was a transcription of a radio script written by some fellow with a Semitic name from the East Side, if you'll pardon my anti-Semitic comments. But anyway, it was obvious it was somebody who had never heard anybody from Missouri speak.

So at that time, they had a Methodist bishop who was on the state board of education, and I was on the faculty of the University of the Pacific. So of course, they'd given him an honorary D.D., so I grabbed Pacific letterhead and wrote him a comment. I said, "You're on the state board of education; you should do something." I prepared parallel passages, and I think that book got retired for a while. That was terrible, to do things like that.

Lage: It really is outlandish.

Hedgpeth: That's when I realized that part of my writing style is inherited or acquired from Washington Irving. I've read practically all of his books.

Lage: You read that as a young person?

Hedgpeth: My mother had a set of him. It's one of the things she kept from Grandfather's library. He was always giving all his daughters books, most of them bought second-hand and so forth. They complained now and then that all he gave for Christmas was old books. It wasn't quite that bad.

Lage: Well, they had their effect on you, it sounds like.

Hedgpeth: Yes. Well, a great effect, because I read all these other things, or looked at them.

Zoology Studies

Lage: Any other professors that you remember? You haven't mentioned many in biology or zoology.

Hedgpeth: Well, of course, my major professor was [Sol Felty] Light. He was a pretty good teacher. And one of the most influential teachers we had there was a visitor for a while. He was put into biology because he was basically a biologist, and that was Charles Singer. He was on sabbatical from England for a year. He gave us a bit of the English flavor. Of course, the procedures are so very different in British universities, they don't fix you up with all these various units and so on.

Lage: A little freer. Did he teach in the English style?

Hedgpeth: Yes. All he asked of us was to write a short paper, graded us on that. He didn't give us exams every midterm and all that stuff.

Lage: Did he bring a different approach to biology?

Hedgpeth: I think so. Though I must say once I pulled one on Dr. Alden Miller, which is kind of amusing. I don't know why I had it in my pocket, but I had a mangrove oyster. The mangrove oyster is a very ordinary oyster. He's a tropical oyster that lives on mangroves; instead of settling flat on a rock and cementing itself, it develops little hook-like structures.

##

Hedgpeth: --anyway, these little hooks attach to the plant. I had this thing in my pocket, and we were waiting for a seminar to begin, and so I pulled it out. Of course, Miller was a professor of comparative anatomy, and evolution, and that sort of stuff. I showed this to him, and I said, "Well, was Lamarck right after all?" He looked at this very carefully and he said, "Well, I sometimes wonder." [laughter]

The other time, though, I really cut pretty close to the bone. This fellow worked on--he actually was an anthropologist. He was working on what it took to come down out of the trees, the different kinds of musculature that the apes have to cling to branches and things. We get sore when we strap-hang from crowded streetcars. He made the point that he got most of his information on musculature of the human shoulder from military physicians who had to patch up damaged soldiers so much.

After he got through with this, there was dear old Professor Miller who said, "Well, how did you like that lecture?" I said, "You know, I think that's the best lecture on comparative anatomy I've ever heard." He looked at me sort of funny, and then I realized, of course, I'd taken his course on comparative anatomy--[laughs]. I said, "Oh, since your course." [laughter]

Voice: Who was that?

Hedgpeth: That was Alden Miller. He was called Aldy Baldy by the students. I don't know whether you get this kind of stuff from these people, names for professors--

Lage: Not so much; every now and then, but not quite as fully--I like J. Dogfish Daniel.

Choosing Marine Biology, and Sea Spiders

Lage: Your memories of undergraduate and at least getting your master's degree must be kind of intertwined.

Hedgpeth: Well, I just hung around for another year, and then I did get a degree, a master's degree, at that time. I went off--see, there were no jobs, you know. I got a job in Washington [D.C.] for a couple of years or a year. About '35 or so, I got on a civil service exam, and listed general clerical--I don't know why I was stupid enough to take that. So I was back in Washington for a little over a year.

Lage: At the National Museum?

Hedgpeth: I wasn't at the National Museum; I was working for the Treasury Department just counting bonds and stuff like that, but on swing shift. For some reason, they were working people on an around-the-clock basis there for a while. So in the late morning and afternoons, I would go down to the museum, and Waldo Schmitt put me to a few routine tasks they needed volunteer workers for, so that's where I got to know Waldo pretty well.

Lage: I see. And were you already interested in marine biology?

Hedgpeth: Yes.

Lage: When did you decide on that as a specialty?

Hedgpeth: Oh, I don't know; it was partly through S. F. Light, the teacher, primarily marine animals.

Lage: Was he a dynamic teacher, a teacher that--?

Hedgpeth: He was a very good teacher; I don't know especially dynamic. Then I did some WPA work for him at the time, drawing maps and pictures of termite heads and similar things. [laughs] I gathered I drove the entomology T.A. [teaching assistant] up the wall, because--

Lage: This was at Berkeley?

Hedgpeth: Berkeley, yes. See, I took entomology, I took a lot of entomology. Old Stanley Freeborn--he was one of the best teachers I think I've had, best lecturers anyway.

Lage: Was he in entomology?

Hedgpeth: Yes. That's him. But anyway, he insisted that we ink in our drawings, and he kept on jabbering German at us, an old German proverb, said, "If you haven't drawn it, you haven't seen it," something like that. But anyhow, we'd be handed these specimens, mostly common stuff that had been illustrated. I didn't bother, I just scratched them in rather loosely. Then every once in a while, he'd come up with some weird tropical outlandish bug you'd never seen before, so I'd draw a very finished picture of it, for my own amusement.

Years later, I was talking to the T.A. and she said, "You know, you made me spend an awful lot of time. I kept looking through books to see where you'd copied those things before I realized what you were doing." [laughter]

Lage: Can you remember or recall or guess why it was marine biology that you--?

Hedgpeth: Well, there was the house next door--

Lage: The sea shells, you told me about the sea shells.

Hedgpeth: Yes. They were all collected by Henry Hemphill, who was well known in his day, had a number of things, including one of our common hermit crabs, named after him. He went all over the world collecting shells for the market and the collectors' cabinets, as well as--he was interested, more, though, in what he was doing, what the relationships of these things were, and he set up plaques of related species and how their differences stacked up in the diagrams. Actually, he had blue card placards

which he glued these things on when they weren't too big. He didn't work with great big things doing this anyway, showing how the lines of relationship were and one thing or another. Some of them, I guess, weren't very good, because the real relationships are in the inner gizzards more than in the shells. But he had all kinds of other stuff, sea fans and palms or whatever kind of octocorals.

Lage: So that sort of caught your imagination.

Hedgpeth: Yes. Well, as I say, like looking into Captain Nemo's salon on the *Nautilus*.

Lage: So by the time you went to Berkeley, did you know this was what you wanted to pursue? It wasn't something that happened that led you into marine biology.

Hedgpeth: Yes. You see, of course, I went to Berkeley out of junior college, so I was already committed to the major there.

Lage: I see, so you were already in marine biology by the time you got here. But there weren't jobs at that time?

Hedgpeth: No. So then I got this job in the Treasury which I quit and came home after a year. I thought I had a bad case of bronchitis or whatever, and spent Christmas holidays alone in the boardinghouse room, didn't enjoy that at all.

Lage: Back in Washington?

Hedgpeth: Yes.

Lage: How did getting to know Waldo Schmitt affect your future?

Hedgpeth: He made available to me specimens for study. As I went on, he got interested in little sea spiders.

Lage: Is that when you got interested in the sea spiders?

Hedgpeth: I got interested in them in junior college, actually. I found one wandering around in the collecting pan.

During the next break in jobs, when I got back, I got offered a job in '38 to study salmon in the streams in connection with the proposals to build dams. We worked on the American River, Yuba River, and Shasta Dam in the Sacramento River, as part of a team to figure out what we could do about the fact that Shasta Dam would cut off the river. Of course, we made recommendations which were never followed. The people are

still complaining about it now, and one of them, of course, is the matter of getting cold water in the streams in the summertime. Of course, the agribusiness world doesn't want to put up with it at all. [See page 114a.]

Lage: So is there nothing new under the sun? Were the concerns and the knowledge in 1938-39 similar to now, or how would you contrast it?

Hedgpeth: I wrote up that stuff independently after we were disbanded; these were temporary jobs, we knew that. In 1945 I wrote an article called "The Passing of the Salmon," pointing out that if things kept on going, we might not have any fish left in the river.

Lage: Where did it get published?

Hedgpeth: *Scientific Monthly*.

Lage: Now, was that a maverick view at the time?

Hedgpeth: Well, I started out with an epigraph of Livingston Stone back in the 1870s, who was the first person to develop fish hatcheries on this coast. So it wasn't exactly new. He said there was no hope for the survival of salmon in the long run.

Lage: But your report didn't get followed?

Hedgpeth: Right. One of those jobs, however, was very influential in 1938, because in the scratch team compiled from the exam list, they included a fellow from Louisiana and Texas, Gordon Gunter. He was with the field, with us for the summer, and then he went back, and then I went on to Shasta Dam. I spent a couple of years there, as a matter of fact. We were based at Stanford University, writing up the report at the end of the field studies, so we didn't get that done until 1941 or so.

Lage: And that one was particularly influential, did you say?

Hedgpeth: Well, meeting Gordon was. Later on, he invited me down to Texas. During the war, they had a shortage of people to work in the--do oysters and things, so I went down there to work with oysters.

Lage: So that's how you got the Texas connection?

Hedgpeth: Yes.

Lage: Were you all the time concentrating on your sea spider also?

Hedgpeth: Some. I was writing papers. I had written--somewhere in there, there's a break of a year or two--I wrote a big monograph on the Atlantic species, and then went on from there out. Of course, there's a lag in publication between completion of a paper and when they publish it. See this?

Lage: Sea spiders.

Hedgpeth: That's my bibliography of papers on these beasts. Fairly complete, because I haven't done very much since then.

Lage: We'll include that in the appendix to this oral history.

Hedgpeth: See, it's under my name here, in sequence. [looking through paper] You can get this in the library. An awful lot of people have written papers about these beasts.

Lage: Oh my goodness, look at that. More than a page worth of citations. Oh, yes, two pages worth.

Hedgpeth: Yes. Bill Fry was a student of mine who died early, he died just a little while after that.

Lage: So he put this together?

Hedgpeth: Yes. This was a fest book affair. There's most of us. No Russians could come, unfortunately. He used the *Oxford Book of Quotations*, because both of these quotes are practically on the same page. I just Xeroxed this thing and pasted it there for those who don't know much Latin.

Lage: Let me see the title page here. That's the meeting held in honor of Joel Hedgpeth, in London, 1976.¹

Hedgpeth: So he wrote a little introduction about me in there. Actually what this is, is a zoological journal of the Linnean Society of London.

Lage: Okay, I'll get that, and we can Xerox those references. Then we'll have a good bibliography [see appendix]. Now, what was it about the sea spider that got you so interested?

¹"Sea Spiders (Pycnogonida), Proceedings of a meeting held in honour of Joel W. Hedgpeth on 7 October 1976 in the Rooms of the Linnean Society of London," edited by W. G. Fry, *Zoological Journal of the Linnean Society*, Vol. 63, Nos. 1 and 2 (1978), pp. 197-238. See Appendix B for introduction and bibliography.

Hedgpeth: They're just strange little creatures. They interest everybody, really, who gets a good look at them: "What the heck are these things, and why are they?" We don't know why they are.

Lage: Were there a lot of unknowns about them, more than--?

Hedgpeth: Yes. For one genus--or family--we have no knowledge of how they reproduce, how they manage to keep going. I once claimed they haven't reproduced since the Pleistocene, but that hasn't been followed up by anybody.

Lage: No one accepts that answer?

Hedgpeth: Yes. So anyway, there's much more in here. Papers by various friends. I wrote one of them, of course.

Lage: Why haven't they been able to figure out how they reproduce?

Hedgpeth: They live in the deep sea, and they've never caught any of them in the act. Most of them we know anything about, when the eggs are produced, the male gathers them in clumps and carries them around until they hatch. But in this whole deep sea group, we've never found any fertilized eggs or embryos. So it's kind of a mystery to what the heck goes on there.

Lage: And you have studied sea spiders in the Antarctic?

Hedgpeth: Yes, I've been down to the Antarctic three times, twice on studying these beasts, third on drafting up an environmental impact study of the activities of science in the Antarctic.

Lage: You mean, how the scientific activities have impacted on the environment?

Hedgpeth: Yes, only I never finished that. They paid me off because they wanted somebody else to do it.

Lage: They didn't want to hear what you had to say, or--?

Hedgpeth: Well, that was part of it. That's the funny part about it. They took my rough draft and turned it over to the next contractor, who was slightly embarrassed since he knew me anyway. So that was quite amusing.

Lage: When did that happen?

Hedgpeth: Oh, some years ago now. The Antarctic business especially had a certain feature to it which had problems, namely, we were infested with double dippers. A lot of the administrators and

people--some of the navy flyboys had become administrators in the Antarctic research program by virtue of their flight experience in Antarctica, the so-called Devron 6 people, meaning developmental unit so forth and so on. So they'd throw their weight around as ex-officers. One of them got out there with a rank of commander.

Lage: How was their scientific background?

Hedgpeth: Oh, they didn't know anything about science. There's a famous story about how one of them was on a big research vessel in the middle of the sea, and he heard this talk around the mess table about the difficulty this fellow was having because some big piece of apparatus was in his way, wished somebody would move it. So this guy went out, picked it up off the bench, and carried it over to the rail and dropped it into the ocean. Clunk, there goes five thousand dollars. [laughter] [See chapters IV and V for more on pycnogonid research and Antarctica.]

Professors S. F. Light and Joseph Grinnell at Berkeley

Lage: Any other thoughts about the university and your experiences there and professors? You really haven't told me much about Professor Light, or the kind of thinking, the biological thinking, that was dominant.

Hedgpeth: Well, actually, Light was teaching two things. In fact, the course he gave has since been divided into three. He was interested in the ecology of animals--field trips in the summer session courses always asking the kinds of questions, "What are these animals doing, or are any of them affecting the other?" and so forth, which are essentially ecological questions, which we were supposed to keep our eyes out for. He also wasn't particularly confined to saltwater; we went through freshwater ponds and streams too.

Lage: In something I read that you wrote, you talked about how he was always dressed not necessarily to splash through the tidepools.

Hedgpeth: Right.

Lage: Was he a pretty formal individual?

Hedgpeth: Yes, he was. We didn't have any nickname for him, but his given names were enough that he never liked them apparently. I for

one never learned how his wife addressed him, what she called him.

Lage: What were his given names?

Hedgpeth: Sol Felty.

Lage: So he just used S. F. most of the time?

Hedgpeth: Always signed himself S. F. Light, or S. F. L. He obviously didn't care much for what his parents had done for him. [laughter] So sometimes, we use those terms, being overfamiliar in our behind-his-back sort of references.

Lage: Was the ecological thinking a fairly common approach at that time?

Hedgpeth: No, it wasn't, except of course we had [Joseph] Grinnell, and Grinnell was one of the great teachers they had there.

Lage: Now, he wasn't in marine biology, he was a zoologist?

Hedgpeth: Yes, he was in furs and feathers. In fact, I noticed this peculiar aversion he had to aquatic birds. The only aquatic bird he ever looked at was the water ouzel that lives along mountain streams.

Lage: But he did have the ecological--?

Hedgpeth: Yes. I think I even refer to him possibly having some hydrophobia, you know.

Lage: [laughs] Did you really believe that, or--?

Hedgpeth: No.

Lage: Was he kind of a dynamic teacher?

Hedgpeth: Well, he was. He had kind of prissy mannerisms, but then--. He liked to come in to the labs and get you into discussion with him, and then he would start weaseling around and drag you off base, and then he'd turn right up sharp and say, "Now, I've gotten you to agree to the wrong thing." See what he was doing? [laughter]

Lage: So you had to keep your thought processes working.

Hedgpeth: Yes. That was the whole purpose of that, of course. You got used to it, but he could be pretty persuasive at that approach to the unwary.

Lage: Were there any fellow students that you had then that you've continued to work with?

Hedgpeth: Some of them have gone now, of course, like Don Abbott, who was one of the best we produced there. The place was so large that you made friendships, of course, with people you spent a little time with immediately, but not necessarily ones that were right in your own bailiwick.

Lage: Did you meet your wife at Berkeley as an undergraduate?

Hedgpeth: No.

Lage: Later, when you came back for the masters?

Hedgpeth: Yes, back from Texas.

Lage: Okay, I think this might be a good time to kind of wind up, unless there are other university comments.

Hedgpeth: No, when I graduated, my degree experiences. I got a masters degree from Light under--.

Lage: Masters degree under Light in '40, 1940.¹

Hedgpeth: Yes, with freshwater copepods. The project, you see, that comes with a masters, they don't take that too seriously, so it was a little project he had in mind and that he wanted to see somebody do. I was trying to figure out the relationship of different common ions to the distribution of several species of these animals, which is an ecological question. I think the main result of the study was tracking out all the good permanent ponds in the area, most of which are now in the middle of subdivisions.

Lage: What animal was it that you were working with?

Hedgpeth: Copepods, the freshwater ones, of the genus Diaptomus. At any rate, I did that for about a year right after I got out of the Shasta Dam business.

¹Hedgpeth, "Factors Limiting the Distribution of Diaptomid Copepods" [Berkeley, 1939].

The Controversial Professor Lund at the University of Texas

Hedgpeth: After that Gunter was responsible for getting me a job in Texas, or asking me to come and take it. He was fairly high up in the hierarchy down there, and the Texas coast was pretty far from everybody at that time. When he got down there, he didn't have very many people coming around to find out what you're doing or much caring what you did.

Lage: Did that suit you fine?

Hedgpeth: Oh, that's fine, yes. We worked on planting oysters and things like that.

Lage: Who were you working for?

Hedgpeth: Texas Game, Fish and Oyster Commission [now Game and Fish Commission]. This was considered a defense-related activity during the war, dealing with food, you know.

So in the course of this, the University of Texas built a laboratory out on the outer shore, and offered me a job there to be their first resident staff member and satisfy the requirement for occupancy to validate the insurance for the laboratory that had just been completed. Gordon Gunter was supposed to be in charge, but he was visiting staff member at the University of Miami for a year. In addition to the watchdog duty, I also signed up under Dr. E. J. Lund, a biophysicist and the campus director of the lab, to work toward a Ph.D. which would be mainly on the work I was doing there, collecting and cataloguing the faunal beasties, which subsequently was my doctoral thesis. Anyway, I took it back to Berkeley with me.

##

Lage: Now, what happened with the Texas experience? You didn't stay there too long.

Hedgpeth: They got into a big fight with my major professor.

Lage: Who did?

Hedgpeth: The administration. There was something going on there for possibly thirty years. They came into hearings with three-by-five cards and would read off a date, "Back about November so-and-so, about twenty-five years ago, when I was away for a few days, an unscheduled meeting was held and I was denied two teaching assistants."

Lage: Oh, my goodness.

Hedgpeth: Well, this stuff. And they had big stacks of these grievance cards or something--

Lage: Was this all common knowledge?

Hedgpeth: I don't know how common it was. A lot of it got into the papers after it blew up.

Lage: Did it conflict with his work at the university?

Hedgpeth: No. What happened was that he got annoyed, they got annoyed, and so one semester, he refused to teach his course in biophysics because the biologists didn't know enough physics and the physics people didn't know enough biology, and he couldn't find anybody really qualified to take the course, so he said. So they wanted to throw him out and deny his tenure and all this kind of stuff. He's an old-style Scandinavian, been to a pretty rigorous institution, he knew a lot more of zoology than most of those people, including the chairman, who was notorious for having counted the human chromosomes in man but making a mistake doing it. His name is Theophilus S. Painter.

Lage: Well, he has a good name.

Hedgpeth: Yes. In fact, Dr. Lund used to address him in memos as Theophilus Schikelgruber Painter. His secretary said, "Is that the way you want to do that?" And he said, "Yes."

Lage: How old a man was Dr. Lund?

Hedgpeth: He was in his sixties, heading toward his seventies, I think.

Lage: So he'd been there quite a while--

Hedgpeth: Oh, yes; as I say, this had been brewing for years. So they were having it out, and I asked the dean, "What's going to happen to us?" He said, "Well, we can't do anything with your problems until we decide what we're going to do with Dr. Lund." One of the things they were trying him for was abusing the university mailing privileges. He had sent a bill of particulars in his complaints about what was going on there to the entire membership list of the American Society of Zoologists on the university mailing privilege. These things were big bulky objects; I guess it ran into several bucks each.

Lage: So that was one of their complaints about him?

Hedgpeth: Fortunately, that's what saved me, because I wrote back to Berkeley and I said, "I've got to come back. Kind of late notice, but is there anything to be done?" Dr. Kirby, who was chairman at that time, wrote a little note and said, "We've just received Dr. Lund's very interesting document. We are arranging for a teaching assistantship for you next term." [laughter] So I came back to Berkeley, finished off there.

Lage: So that's where you got your Ph.D., and did you continue the same study?

Hedgpeth: Yes. See, they don't like people to get all three degrees at the same place. That's why I was trying to finish off at Texas, but they sort of waived that in this connection. I possibly had gotten enough experience of how another institution was like anyway. [One unexpected dividend was my acquaintance with Professor Carl Sauer (Geography). Starker Leopold suggested I audit his course 103; when I requested permission, Professor Sauer said fine, but he would like me to take over a couple of his lectures when he had to go East, so I talked to his class about the biology of the sea. Ever after when I visited Berkeley I would drop in and chat with him. A marvelously inspiring man. --JWH, October 1995]

I don't think things have been quite that bad at Texas lately. First place, all those old war horses have gone on their way now.

Lage: Well, I should hope so, by now.

Hedgpeth: Yes. There were some strange ones there. William Morton Wheeler, who went to Harvard, started his career at Texas.

Lage: Was it a good department overall, aside from--?

Hedgpeth: Well, I gather it was pretty bad even back then. They didn't have anything much for him to do, so he took to studying ants. So that's that.

Lage: Well, I think we've probably talked enough today, and we've come to a good stopping spot. [tape interruption] As we turned off the tape, I said, "Well, we got you educated." You had a snarly response to that.

Hedgpeth: Sort of. Most of my education was outside the halls of academe.

Lage: Now, that's what we want to cover next time.

Hedgpeth: Oh, you do?

Lage: Yes, the part that's not written down and doesn't have a diploma.

A Boyhood Interest in Shells and Sea Creatures

[Session 3: September 2, 1992] ##

Lage: This is our third session with Joel Hedgpeth. Our topic for today is "the making of a marine biologist."

Hedgpeth: Well, this all begins with the big house, of course. My grandfather's library, stuff in the attic, plus the house next door, which was inhabited by the descendants of Henry Hemphill, who was a very eminent shell collector in his day. He traveled all over the world collecting shells for the market and for himself. He arranged some of them in nice patterns of variation, not very strongly Darwinian, of course, but very pretty.

Lage: More for the looks than the scientific qualities?

Hedgpeth: Yes. But he kept pretty good information, and he was very well known in his day. In those days, the zoologist at Mills College was a mollusk specialist, Josiah Keep. His daughter Rosalind became interested in fancy printing. She was on the Mills faculty afterwards.

Lage: Where was he affiliated?

Hedgpeth: Mills College. So the house next door was full of shells and everything else. It was sort of like wandering into Captain Nemo's salon in the *Nautilus*. Things were a bit crowded. Of course, he died before I was born, so I never saw him. But this was his granddaughter, or grand-niece, I don't know which relation she really was. She was fairly well-to-do. This family, the Hosmers, had made their fortune in granite quarrying over near Raymond, over east of Fresno or east of Merced, and she helped me through college. She gave me \$100 every once in a while, and that was a great help in those days. So I always like to say that the Campanile sent me through college, since the family had the contract for supplying a lot of that granite you see around the campus.

Lage: Oh, I see; that's a good connection! [laughter]

Hedgpeth: Yes, it was a very definite connection. But anyhow, I was raised--

Lage: So that was really a direct connection, the shells inspired you, and she helped you go to school.

Hedgpeth: Yes. I used to go over--yes, well, that of course came later. But I often came around to look at the shells. They moved several places after they left west Oakland. One of them was up there right in the middle of where that main freeway from Lakeside goes up over the hill. There used to be a lot of streets in there that are gone now. One time, I met a young lady who was studying their shells. I reminded her of that; she had forgotten about it. It was Myra Keen, who was chief shell specialist, conchologist they call them, in this part of the world. She was at Stanford, and she wrote one of the definitive monographs on the mollusks, at least the shelled mollusks, of tropical America mostly, this side, of course, and down into the Gulf of California.

And there was this book which I--some of it I read, and some of it I never did read. [pulls out book]

Lage: This was from your grandfather's library; I think you showed me this before.

Hedgpeth: Well, yes, I showed it to you before, but this is not the identical copy from my grandfather's library.

Lage: *Sea and Land.*

Hedgpeth: Yes. It was one of those things they sold as subscriptions, full of all kinds of mistakes.

Lage: Well, do you think at the time--you didn't know these things weren't true at the time?

Hedgpeth: No, I didn't know.

Lage: But this must have appealed to the young boy.

Hedgpeth: Oh, sure.

Lage: I mean, just the titles here: "Horrible monsters of the deep," and "Mysteries of the deep sea."

Hedgpeth: Oh, yes. And maybe the reason I didn't get too far on in the second half was, of course, it was all about things on land, mostly Africa. And you saw too many of these scenes, people get

eaten up and so forth. There were parts of my grandfather's library I never even got to; they were in big locked cases. Not locked to keep people out, but to keep the doors closed. I've got to keep that bookcase locked.

Lage: Just to keep the door closed?

Hedgpeth: Yes, the weight of the books warped the bookcase so that the door doesn't quite match the frame.

Lage: Well, lucky this book was in one that you could get to.

Hedgpeth: Oh, yes. It was down in the lower shelf.

Lage: But it is interesting to think that the land portion didn't interest you as much.

Hedgpeth: Yes.

Lage: And what would it have been, I wonder, that--?

Hedgpeth: I don't know. I always liked to look at ants.

Lage: What do we have here, *A Naturalist at the Seashore?* [by William Crowder (1928: The Century Company)]

Hedgpeth: Well, this is a book I picked up in a drugstore, they had a little rack of books for a dollar apiece. This was back in 1930 or so, or 1929. It is written in a rather charming style. The guy was a pretty good illustrator, but he described these animals, sea spiders, in great detail and came to a conclusion that's never yet been proven. In fact, it's not possible because the young have no way of penetrating to the integument of the parent. So it's not possible for the young to be nurtured by being able to be fed somehow by the fathers, as Crowder suggested. Well, there's no way. These things don't have teats.

Lage: [laughs] Treating them as mammals?

Hedgpeth: Yes. Well, he suggested--because they all died at once. Well, they probably all died at once because his aquarium probably went sour.

Lage: Was this when you were already into your study of the sea spider?

Hedgpeth: No, I didn't see sea spiders until after I read this. The first one I saw was in 1930 there in the San Mateo beach actually

near--well, practically right at Pebble Beach. Do you know where that is, down south of Pescadero?

Lage: Yes.

Hedgpeth: My grandmother used to spend hours there. She stayed at a San Francisco neighbor's summer house up Pescadero Creek a ways, and would go down there in the morning. The old ladies who lived around there or lived in a hotel nearby would gather at Pebble Beach, each on their own blanket, and search for carnelians.

Lage: Along the beach?

Hedgpeth: There are not very many there even to this day. I was suspicious when Don Kelley wrote a nice book on the Pacific seacoast that he had a picture taken at Fort Cronkite showing about six glowing carnelians; I accused him of salting his picture. He didn't deny it. [laughter] But I wouldn't be surprised.

Lage: Why were they searching for carnelians?

Hedgpeth: Because they are clear. They are quartz, of course, mostly yellow. They are very similar to the cairngorm which is found in Scotland, where it is used as a semi-precious stone in brooches, you know those great big brooches that hold the kilt at the shoulder.

Lage: Were they in fashion at that time?

Hedgpeth: I don't know. It's kind of hard to find them, but they're just a variety of quartz.

Lage: Did this book have something to do with your interest in sea spiders?

Hedgpeth: Yes. I read it, and I remembered it, and then I first saw one in a collecting pan at Pescadero. I was taking biology in San Mateo Junior College at the time and a classmate and I drove there on a private field trip. So it reminded me of what I read about them, and I got interested in looking at them a little more closely.

Lage: Well, it's interesting. Most people can't point to books or something specific that first caught their interest.

Hedgpeth: Oh, I learned lots from books, papers. I think I was reading fairly early.

More on College Studies in Zoology and Biology

Lage: In 1930--is that the date you gave me when you first saw sea spiders?

Hedgpeth: I think so.

Lage: And where were you in school at that point?

Hedgpeth: I was in junior college. I took biology there. I didn't take any high school biology for the simple reason that I couldn't schedule it, and the other reason was that I knew more than the teacher anyhow. Not that that was knowing too much, to say the least. But I went on a field trip with the class one day, and found out most of the kids had to prompt her on what she was looking at, poor thing.

Lage: Was the instructor in junior college better?

Hedgpeth: Yes, he was very good. He was a recent Ph.D. graduate in the Depression, and he had to take a junior college post. Now, that caught a lot of people, that period, coming out, like Fred Tarp, who now lives at Sea Ranch. He was very good at fishes, but when he got his degree, there wasn't any job for people like that, so he had to take one as an instructor in zoology.

Lage: So the people going to community colleges benefitted.

Hedgpeth: Yes. Well, they paid better salaries at the lower level before --see, you get a salary after you've been there a couple of years better than a beginning assistant prof at the university. You can't pull out very easily. It caught a lot of them that way, I know. There were several good grads at Berkeley who got stuck that way.

Lage: I remember interviewing Lincoln Constance, in botany, and Sandy Elberg, in bacteriology.

Hedgpeth: Lincoln Constance, did you do him?

Lage: Yes. After he got his Ph.D. at Berkeley in 1934, he went up to Washington State College, and I think Sandy Elberg went to San Francisco Community College for a time, before he got hired by UC.

Hedgpeth: I remember old Lincoln for his trick of going around pulling the labels off the campus shrubbery.

Lage: [laughs] Didn't believe in--?

Hedgpeth: Well, usually it was just before he would stage his practical exam in botany and so forth, and then he would rail at people who couldn't identify some large tree on the campus. He'd say, "I think it's been labeled for years, why didn't you read the label?"

Lage: Do you remember him as a professor?

Hedgpeth: Oh, I didn't have him. The only botany I took at Berkeley was [William A.] Setchell's course in the history of botany. I was a zoology major, but my friend Dan Axelrod suggested I take the course. Dan and I were high school classmates. He's up at Davis now. He got to specializing in fossil plants which carried him out into desert areas where there wasn't an available can of beer for 100 miles, you know, and that kind of stuff. Kind of hard on paleontologists.

Lage: The hard life. So by the time you went to Berkeley, were you focusing on marine biology?

Hedgpeth: Not strictly, just zoology. About the only thing I knew about it was trips to the seashore, conducted by Dr. Light.

Lage: You mentioned somewhere that Dr. Light never quite approved of you. What did you mean by that?

Hedgpeth: Well, I had that feeling. I guess I was a little too erratic in my behavior in those days, made too much noise perhaps. But I wrote a poem about pycnogonids, and he said, "You must be severely depressed." I hadn't thought of it that way at all.

Lage: I wonder what he was reading into it.

Hedgpeth: I don't know. If you read Bullock's account of Dr. Light--I guess it's in the front of Light's manual--you will get some idea of his personality. It has become a standard guide for the local marine invertebrate fauna. In fact, I suggested the running title that they're using now. They've got Ralph Smith editing the second edition, came up with this intertitle, *Invertebrates*, by S. F. Light, by R. I. Smith, and two or three others. There were too many authors involved. I said, "Well, just call it *Light's Manual*, that's what we always called it anyway."

Lage: So that's what it's come down as?

Hedgpeth: Yes. I also drew a couple of the designs for it. That one showing a mussel eating a starfish, and so on.

III ECOLOGICAL THINKING, ED RICKETTS, AND PROGRESS

The Concept of Ecological Communities in Marine Biology

Lage: As I've been reading various things you've written, and others, the topic comes up of ecological thinking in marine biology. Is that something that developed in your lifetime, or has there always been ecological thinking in marine biology?

Hedgpeth: Actually, that point of view goes back to the 1870s, when Carl Moebius from Kiel wrote a little book on the oyster, oyster culture, *Die Auster und Austernwirtschaft*. That thing had never been really properly translated. It was translated by the Bureau of Fisheries by somebody who was reasonably facile at literary German, but I remember I tried to translate that section on the definition of the natural community which he called a biocoenosis at that time.

Lage: Was that a new approach at that time?

Hedgpeth: Oh, yes, that was the origination of the term, and the whole idea that groups of animals had some interrelationship of some sort. But he was a bit mystic on it, of course. I thought maybe I didn't know as much German as I thought I did when I got balled up in a sentence, so I sent it to Karl Banse in Seattle, an old friend of mine from here and there. He was born in Konigsberg. He came back with the comment, "That sentence is far from clear." [laughter]

Lage: So it wasn't your German.

Hedgpeth: No, it wasn't that. I haven't got around--I was going to write this whole business up, and I gave an introductory paper about three or four years ago at the congress on the history of oceanography.

Lage: When you say "this whole business," what do you mean?

Hedgpeth: The origin and the concept of the community and how it drifted away from the original. I pointed out I was glad to see the Danes had taken on Carl Georg Johannes Peterson's theory that the eel grass was the foundation of the community in Danish seas. That is, it depended on the detritus of the eel grass. Well, they had die-offs or mortalities of the eel grass for several years in the twenties and thirties, and nothing happened to the rest of the animals, so eel grass obviously wasn't it. What they had left out was the plankton, and oddly enough, the geese, the black brant. They live on eel grass. When the eel grass disease killed off great beds of it in Europe and eastern America--not from this side, though--the black brant decreased. Of course, since they are a game species in Europe, you had lousy records even among the conscientious Danes, who also would fib on their bag.

So I got through with all this, and somebody in the audience said, "In that case, why did you let Thorson get by with that paper he wrote for the treatise?" I said, "Well, frankly, fellows, I didn't know enough then."

Lage: You'll have to fill me in on the paper you're--

Hedgpeth: Well, that's the one I mentioned. Thorson wrote a whole idea about communities, carrying on from Peterson, who was his great master and gospel giver. He got off on the deep end making too many generalizations based on inadequate data and so forth. But he had a lot of us mesmerized, and he could rattle off so much in such a short time. In fact, some of the students down at Scripps when he was there as a visiting investigator, called him "machine-gunnar" Thorson.

Lage: And he taught at Scripps?

Hedgpeth: He was doing research at Scripps. He was there as a visiting investigator. I suppose he gave a lot of lectures, but anyhow, I don't think he was a visiting faculty member as such.

Lage: What was the level of ecological thinking when you were a student of marine biology? Did Light take that approach, or any of the others?

Hedgpeth: No, he wasn't interested in that sort of ecology. He was interested in observing what the individuals did, and observing how they were arranged on the seashore, tidal level or wave shock. That sort of thing. But he was primarily interested in morphology. He was always somewhat skeptical of some of these

wild ideas about phylogenies. Somebody said, I don't know who it was, maybe it was Libbie Hyman, that phylogenies are best grown on an eclectic diet.

Lage: [laughs] That's a great statement.

Hedgpeth: Yes, isn't it. They're still at it.

Lage: What kind of wild ideas are we talking about?

Hedgpeth: Oh, which group of animals originated from the other, or something of that sort.

Lage: A lot of effort goes into this kind of discussion.

Hedgpeth: Oh, yes, still does.

Lage: Is your approach an ecological one, would you say? Or has this been a trend in biology?

Hedgpeth: Well, it's been more lately than--because I've put quite a bit of it in *Between Pacific Tides* from time to time. It's interesting that Ed [Ricketts] spotted one of the fundamental things that almost everybody else overlooked. In fact, he saw this in the abstract of an obscure paleontological paper by a man named Cabrera in Argentina.¹ And that is, you can't have two closely related species similar in food habits or structures and needs within the same group or community of animals. That's called now the law of competitive exclusion, and great reams have been written about that, too.

Lage: Now it's a law. Not an observation, but a law.

Hedgpeth: Oh, yes. The laws. Lately they've been called paradigms.

Lage: I think that's a better word, perhaps. Somehow "law" has such finality about it.

Hedgpeth: Yes.

¹Cabrera, Angel. 1932. "La incompatibilidad ecologica. Una ley biologica interesante." An. Soc. Cient. Argentina 114(5/6): 243-260. Ricketts saw only the short summary statement in the 1935 volume of Biological Abstracts. --JWH.

Ed Ricketts, a Marine Biologist and Steinbeck Character

Lage: Is this a good time to talk about Ed Ricketts, and what his contribution was to marine biology, and then also how you knew him and how he might have affected you? That's a lot of questions together.

Hedgpeth: Yes, it is a lot of questions together. Of course, by the time I met Ed, I think I was senior or maybe graduate, I don't know, at this point. I'm trying to think, because it involves another aspect of family history, namely that one of my mother's dearest friends lived in Pacific Grove, and as soon as I learned to drive and had a car to run around, I'd take her down there every once in a while. These two old ladies would tell stories, unfortunately before the period of handy tape recorders, so we don't have much taken down what they said. She was Constance Bigelow Mainwaring. One of her granddaughters lives down in Petaluma right now.

They had uncanny memories. They remembered everything. Never forgot anything.

Lage: Did you enjoy listening to them at that point, or did you go off to the beach?

Hedgpeth: Oh, I went out to the beach. Since we were using Ricketts' book, I went out there to see what he was like. We were about the same--

Lage: You were using his book in school?

Hedgpeth: Yes, *Between Pacific Tides*. See, now that would have to be after the first edition, '38.

Lage: My notes show that you met Ricketts when he was working on *Between Pacific Tides*. I have '38 or '39.

Hedgpeth: Yes. It was after I did this tour of duty, the salmon study in Shasta Dam. That was '38 or '39. In the forties, I was doing graduate work on a master's degree, working on some little project Dr. Light thought would be suitable, namely distribution of copepods in various ponds. Most of those ponds have now been built over, ain't there any more.

Lage: So you went off to meet Ricketts because of your interest in his book.

Hedgpeth: Yes, I was out there. My mother and Con would talk about things before my time. [laughs] They're all gone now, except the one who's named for my mother, and she doesn't remember anything any more at all, which is kind of sad.

Lage: So you wish--it would have been nice to have had a tape recorder and--.

Hedgpeth: Yes.

Lage: Now, I'm going to move you back to marine biology.

Hedgpeth: Right, and get back on the track. Well, that's why I often went down to Pacific Grove and got into the habit of going down there. One thing led to another. Ed had very little ability at drawing anything.

Lage: Did he get others to draw for him?

Hedgpeth: Yes. So I offered to draw some maps for him, which I did. Then after the war began, I went down to Texas, and sometimes supplied him with animals he needed, had a market for. I was working for the Texas Game Fish and Oyster Commission, and we did a lot of collecting and trawling out in the Gulf of Mexico, so we gathered stuff like sea pansies that are not easy to find around here, since they are tropical animals.

##

Lage: The picture we have of Ed Ricketts is based mostly on [John] Steinbeck's works. Is that an accurate picture from your point of view?

Hedgpeth: In some ways, yes.

Lage: Comment on that, now.

Hedgpeth: Well, I think he's a little overimpressed by Ed's sexual activities. He'd prefer to talk more about them. That's what John used to talk about. I saw Carol some years later when I was putting the *Outer Shores*¹ things together. All she said about that matter was, "Well, Ed was goaty."

Lage: Now Carol is--?

¹The *Outer Shores*, edited by Joel Hedgpeth (Eureka: Mad River Press, 1978).

Hedgpeth: Carol was Steinbeck's first wife. She was divorced by then. She was apt to tell you about anything straight between the eyes.

Lage: Was Steinbeck's depiction of Ricketts as a marine biologist one that you would agree with?

Hedgpeth: Well, he made it sound too easy. I gave a little lecture, I don't know, did I give you a copy of it? First memorial Ricketts lecture, started that down at the Monterey Aquarium, and I was the--

Lage: No, I don't think you gave me that.

Hedgpeth: It would be a lot better to dig out a copy. I try to set the balance right, because it got written up the way Steinbeck would have written it about how Ed used to collect at La Jolla, and get enough money for beer for his ricketty lab. Of course, I am annoyed by the pun to begin with. It wasn't quite that ricketty. And this was published in the *New Scientist* magazine. So I protested to them. I said, "That's pretty exaggerated. Besides, you didn't explain that La Jolla and Pacific Grove are about 400 miles apart," or maybe 500, I guess, "by road, and the impression you give is that they're right next door. Besides, no biologist collects on other people's collecting or study grounds. You could lose your license for doing that." He had grounds to sue them for libel. I scared the wits out of the poor woman.¹ [She phoned Steve Webster, education director of the Monterey Aquarium, to ask if I had said anything actionable in my presentation. --JWH, October 1995]

Lage: Were you saying that Ricketts didn't collect down in La Jolla, or that--?

Hedgpeth: No, he bypassed La Jolla. He went right down to Ensenada, into Mexico. His favorite spot was the Bahia de Todos Santos, right south of Ensenada, for a lot of the material subtropical in nature. That was one of the southernmost locations that he included in *Between Pacific Tides*, mentioning things occurring that far south. So anyway, he read quite a lecture, I think, on that, and he went some distance from Monterey so as not to collect things too near--. See, this place in Cannery Row was only a couple of blocks away from Hopkins Marine Station.

¹The original text was never distributed. A simplified version was published as, "Ed Ricketts (1897-1948) Marine Biologist." The Steinbeck Newsletter (San Jose State University), Fall 1995, Vol. 9, No. 1: 17-18. [See Appendix C.] --JWH, October 1995.

Lage: Was that a problem of intruding on other--?

Hedgpeth: Well, it would have been. They don't want collecting on their grounds. They're celebrating their hundredth anniversary, or did this past week.

Lage: Why did it not become a problem?

Hedgpeth: Because he didn't make it a problem. He collected elsewhere, down the great tidepools south of town, and so on. Further down, or all the way up to Sitka. He had a run, one of his regular trips was up here to somewhere along Point Reyes, Duxbury Reef and then further north. Duxbury is now a reserve status. The problem with Duxbury, it's soft rock, and you can knock it to pieces easily.

An Ecologist and Systematist

Hedgpeth: So I became a zoologist simply by majoring in zoology.

Lage: Now, you're making it so simple here.

Hedgpeth: Well, I guess not.

Lage: How did you become a zoologist with your particular point of view, your way of approaching problems? Or, what is your particular way of approaching them?

Hedgpeth: At the present time, just trying to understand the interrelationships of these groups, what eats what, and what is just around for the fun of it, so to speak.

Lage: So you do have that ecological approach.

Hedgpeth: Yes.

Lage: Is that a more accepted or more dominant approach now?

Hedgpeth: Oh, I don't know. Of course, I'm also a systematist. I worked in two groups of animals, freshwater shrimp and these pycnogonids. I've worked in the Gulf of Mexico species of big freshwater shrimp. Some of those are used now in aquaculture, great big palaemonids about this big--small lobsters, so to speak. Anyway, I did a little monograph on them. I was down in Texas because they had about four of the five known species in

North America in Texas waters. Some of them will live in brackish water, but they're primarily fresh.

One of the amusing things is that the most common one is named *kadiakensis* or something like that, and it must have been a mix-up in labels, because it's never been found in Alaska or the Aleutians or anyplace like that. Those errors are caused by mixing up labels and bottles.

Lage: I'm never going to get the spelling of that one.

Hedgpeth: I forget now whether that's exact--I haven't done anything with that group for years, but it was a name more closely associated to Alaska.

Lage: And the shrimp itself was--?

Hedgpeth: It was easy to happen; some guy has whole lot of these little bottles of things and labels stuck in them, and dropped the wrong label in once in a while. Sometimes the bad locality is simply the address of where the fellow was working.

Lage: At the time?

Hedgpeth: Yes.

Lage: [laughs] Well, that throws the future into a little detective game, doesn't it?

Hedgpeth: Well, yes, we're always trying to straighten things like that out. Of course, we can't change the name, even if it was wrong.

Revising Between Pacific Tides¹

Lage: Let's go back with a little bit more on Ricketts, since you seem to have spent a fair amount of time doing work about his work and his life, in your *Outer Shores*, for instance, and revising *Between Pacific Tides*.

¹*Between Pacific Tides: An Account of the Habits and Habitats of Some Five Hundred of the Common, Conspicuous Seashore Invertebrates of the Pacific Coast between Sitka, Alaska, and Northern Mexico*, by Edward F. Ricketts and Jack Calvin, revised by Joel Hedgpeth (Stanford University Press, latest edition 1968). (Revised 1985 by David Phillips, with Joel Hedgpeth as coauthor.)

Hedgpeth: That was after he died.

Lage: Right. Was there a reason you got involved with this?

Hedgpeth: Yes. Well, the main thing is because I was down in Texas at the time that he had his accident, so I'd drawn these maps for him, was making suggestions about the pycnogonid fauna, and some things ought to be where he hadn't got them or something like that, and he had started a new edition. So when Stanford [University] Press was stuck with this, I was the first person they thought of looking up.

So I agreed to do the job. It was rather painful, the first edition. They didn't want a single thing changed unless--

Lage: Hadn't Ricketts finished his second edition when he died, or do I have that wrong?

Hedgpeth: I guess it was, yes.

Lage: And it came out just shortly after he died.

Hedgpeth: Right. So they wanted a new one, because they didn't want to risk too great a publication. At that time, they didn't know whether it was going to fly or not. So I took it on from there.

Lage: You took on the new edition?

Hedgpeth: Yes.

Lage: And tell me about that, working on that. They didn't want to change anything, you said?

Hedgpeth: Well, for the first time, they didn't want to change anything unless a new word would require the space of the old one. They were niggardly in their printing bills and hated to have to change anything, even a name.

Lage: What's the point of doing a new edition then?

Hedgpeth: That's it. So anyway, things got better through the years, and they allowed me to make more and more changes.

Lage: What kind of changes did you need to make?

Hedgpeth: Sometimes statements of fact or observation that we'd learned a little more about since. And lots of times names of these things are changing as people work on them and decide mistakes had been made in identification, if they showed they belonged to

another species, or something like that. Then I added sections to it. But the main thing is keeping up that annotated bibliography. They wanted to throw that out in the first edition, and Light urged them not to.

Lage: So that was something that Ricketts had started?

Hedgpeth: Yes. That was kind of fun to keep it up.

Lage: I did look at your annotated bibliography and found myself chuckling quite a bit at some of your annotations.

Hedgpeth: Yes.

Lage: I also was interested that you included children's books in the bibliography. Was that something Ricketts had started?

Hedgpeth: No, not really, but people ask for references to children's books, and they seem a little less pretentious in this book for grade school use or children. So I wound up writing that little paperback job¹ which I am now going to try to bring up to date. In fact, I've got some of it started.

Lage: Is that for young people?

Hedgpeth: That's for everybody. It describes the localities between Point Arena and Año Nuevo.

Lage: And what's that called?

Hedgpeth: Well, let's see. *Seashore Life of the Central California Coast, and/or San Francisco Bay*. I'm trying to get an easier title. I'm going to include more about the bay, especially this business of introduced species changing whole faunal patterns.

Lage: And this is a book for the layman?

Hedgpeth: Yes. It's been very successful, sold 45,000 copies, though sometimes I wonder about that, because I was out in the seashore one winter afternoon on a Sunday, fairly nice; tides are low in the middle of the afternoon that time of year. I saw people with buckets of snails and things and one man with a copy of my book sticking out of his pocket. First thing I said in it is, "Don't take all this stuff home. It dies and starts to stink on you anyway." [laughs]

¹Joel Hedgpeth, *Introduction to Seashore Life of the San Francisco Bay Region* (University of California Press, 1962).

Lage: They didn't read that part.

Hedgpeth: Well, I didn't say anything about it, but obviously they hadn't read that part. Or if they had, they hadn't really taken it to heart.

Lage: That must be disconcerting to you.

Hedgpeth: I think there's more consciousness now about that sort of thing, except in Mr. Dan Quayle's [then vice president] opinion.

Lage: [laughs] I knew we could get Dan Quayle into this discussion somehow.

Hedgpeth: Reminds me of the time that President Bush was being chided for his fondness for hunting quail out in the big ranch in Texas, you know. He said, "That's not unkindness to animals. After all, quail aren't animals, they're birds." [laughter] Well, you know, that's what you call a non sequitur, aside from a lack of knowledge of the English language. Appalling in anybody. Theodore Roosevelt would have blown a gasket at that.

Then we have had only one president who was a competent naturalist.

Lage: We have had only one?

Hedgpeth: That's right.

Lage: And who was that?

Hedgpeth: Theodore Roosevelt.

Lage: That's a long way back.

Hedgpeth: I remember his book used to be in the parlor on every library table, *African Game Trails*, mostly pictures of Teddy with his foot on the neck of some poor recently deceased wildebeest or lion or something, all the way through the book. "Great animals I have shot."¹

¹Later I looked this detail up. On pp. 532-533 of *African Game Trails*, there is a tabulation of "Game Shot with Rifle" that lists 296 beasts and large birds, including nine lions, eight elephants, thirteen rhinoceros, fifteen zebra, six buffalo, and all sorts of other "game" shot by Theodore Roosevelt, and another bag of 216 by his son, Kermit. TR states on page 534 "we did not kill a tenth, nor a hundredth part of what we might have killed had we been willing." Most of the killed were

Lage: [laughs] Well, that's a particular kind of naturalist.

Hedgpeth: Yes. But he also took a part in this great nature-faking controversy at the turn of the century. They were after William J. Long for writing exaggerated things about what animals did or could do. Problem was that he had never--the real critical observations of animal behavior are fairly recent, people like Tinbergen and Lorenz. Tinbergen was a genius at thinking the right questions to ask and how to ask them.

Lage: Who was Tinbergen?

Hedgpeth: Tinbergen, he was the Dutchman. He went to Oxford, had a whole group. He and Lorenz complemented each other. Lorenz didn't quite ask questions. Then there, of course, was von Frisch and his bees.

Lage: This is taking us far afield.

Ethology: A Recent Development in Ecology

Hedgpeth: Yes. But that's one of the recent developments in ecology, as it's called, ethology. The actual study of why birds and mammals do the things they do.

Lage: The study of animal behavior?

Hedgpeth: Yes.

Lage: And that is tied into ecology, or a part of ecology, or another field?

Hedgpeth: Well, it has something to do with it. Grinnell was a pretty good ecologist. He saw some of the problems right away. He considered the influence of vertebrates on dispersals of seeds and that sort of thing.

Lage: He was at Cal, wasn't he?

Hedgpeth: Yes, he was one of my professors. I took his course.

Lage: Did he have an influence on your outlook?

destined for an immortal life as stuffed museum exhibits: *finis curonat opus indeed!* --JWH.

Hedgpeth: In some ways. One of his assignments, he sent us out to study something or another (I studied a group of ground squirrels). That reminds me, of course, that when I took invertebrate zoology, we each had to do a project, so I did a project on the pycnogonid fauna of Moss Beach--the beginnings of my first paper on the beasties. That was where I noticed that from one year to the next, the gross abundance of two species more or less alternated.

Lage: One would rise and the other fall?

Hedgpeth: Yes, one would be more numerous one year than the other, yes. But it was very subjective at the time; I only realized it in observation. To do the job right, you've got to run counting in squares and so on, to see what the relative populations are.

Lage: Have you followed up on that, then, or has somebody?

Hedgpeth: Not really, no.

Lage: It's still an observation.

Hedgpeth: And Moss Beach has been so trampled-over now that it isn't what it used to be. It used to be a great collecting spot. Light held one of his intersession courses there. They don't do those any more, do they?

Lage: I don't believe so.

Hedgpeth: They used to have about a week called intersession, they'd cram up to get a couple of units.

Lage: Would this be in the winter, January?

Hedgpeth: Spring, I think. It had to be a time when these critters are easily available. But anyhow, something long gone and forgotten.

Lage: They have it at other schools, I've noticed, in college catalogues. They have a lot of intersession. But I don't think Berkeley does.

Hedgpeth: Incidentally, the remainders of the Hemphill collection are now at Stanford, and Dennis Murphy is a member of that family, a descendent. In fact, his uncle, Al Murphy, runs the Hopland Reserve. You've been up there probably and seen it.

Lage: I haven't been there, but I've heard of it.

Hedgpeth: Yes. I happened up there to--I had drawn a big picture for Bee once, of a carpenter bee, and she had promised to have it sent back to me when she died. So word came to me that Al had it up there, of course. I went up there, and Hopland is off the road a little, in the hills. Secretary says, "Shall I--who are you? Shall I explain to Dr. Murphy?" I said, "Just tell him I knew him when he wasn't as high as the top of this desk." [laughter] About ten minutes later he came trotting back with the picture. He said, "You're the only person that could have ever said that." [laughter]

Lage: And Dennis Murphy is at Stanford?

Hedgpeth: Yes, he's Paul Ehrlich's lesser. He works on butterflies too.

Lage: And he's descended from the Hemphill--

Hedgpeth: The Hosmer-Hemphill line. They had asked me if I could find a place for the shells in the Oakland Museum. They wouldn't even give me the time of day there. I was suggesting something rather different, because I know the museums now have little interest in just cabinets of seashells. I was suggesting a standing glass pillar display cabinet to the theme of education in Oakland back in the nineties with old-styles microscopes, Josiah Keep memorabilia, and some of those nice exhibits put in there, and they could move them around, and change them from time to time. I went around to find out what they thought of it, I was told that person wasn't in, go away.

I have had two strange encounters with the Oakland Museum, never quite figured out. One of them was when they had an article about their interest in the existence of old quilts in the neighborhood, or in California, central California. They wanted a roster of all of them. So I wrote and I said I had my great-grandmother's engagement quilt made in the 1830s in which her maiden initials were sewed, and the initials of each person's different kind of stitch, and this obviously made it an unusual quilt--I think it was a tulip quilt. I've still got it. But I never even got a reply. Funny, they requested it. I said I'd be glad to bring it down and have it photographed if they liked. It was in reasonably perfect condition--except the usual thing that happens to these old quilts. The magenta goes bad and starts to rust out in some of them. The blues stay fast because they're indigo. But not even an answer. So I said, "Well, it's going to go to Oregon, then." My daughter will get it when I get through with it.

Ricketts and the Influence of Between Pacific Tides

Lage: I want to get more, if we have more to say, on Ricketts. You've done so much work on him, and I know you can't repeat what you've done there, but I'd like to get some observations.

Hedgpeth: Well, we used to discuss where certain things were found when we knew about them, and that kind of thing. One time he told me he had never been to see a tropical coral reef. He had never gotten around to it. He wanted to, but it's funny. I think he never gave up hoping.

Lage: Did you see him as a more serious worker in the field than maybe Steinbeck would portray, or--?

Hedgpeth: Yes. He liked the literature pretty well. He knew good and bad literature when he saw it. As I say, I wrote this piece explaining some of that, what it took to do what he did. See, he was working before computers, and to do that tidal study that he'd done on the different levels and all of that, he had to go up to the San Francisco office of the Coast and Geodetic Survey and copy the raw data sheets. I had to do the same thing in Texas, actually, in the 1940s or so. What they had were the tabulations of the times and heights of tide. They didn't even have a graph. They just took them off on the hour, somebody had to do it diligently by longhand. Then you could work out the curves from that data and so forth. It was a tedious thing to do.

Now, of course, a computer simply spits out a piece of paper at the end and the job's all done for you. Different world, you know.

Lage: So the work he did in preparing *Between Pacific Tides* was not all romantic and--

Hedgpeth: No, he conducted a lot of correspondence between specialists, especially in Washington, D.C., and various groups. He had some knack or a way of getting them to do more or less what he needed--well, of course, after *Between Pacific Tides* had been published, it was quick to see you were dealing with someone more serious than just somebody who wanted some of Grandma's pretty shells named for their convenience (the bane of the existence of the mollusk division of the National Museum).

Lage: Did that book, *Between Pacific Tides*, have a deciding influence on marine biology on the West Coast?

Hedgpeth: It had a very strong influence, because most everybody used it. It influenced Gene Kozloff into writing his own books on Puget Sound area. He was a Berkeley student. He's an interesting character, too. He might be worth looking at, except he's way up there. He's now retired to Friday Harbor.

Lage: So it influenced how other people approached marine biology?

Hedgpeth: Well, and getting their own books out, too. See, Gene was born in Teheran after World War I. His father was an officer in the diplomatic service. I remember the last time I saw him, I guess I was at the University of Washington, and they have these great big sky-high footbridges over the highway that goes right through the middle of the campus. I asked where he was, and somebody said, "Well, he's about the third level down, 100 yards away," and I couldn't think of anything else to do. I yelled his name at him in Russian, "Yevgenny Nikolayevich." He spun right around, and came right up to me. [laughing] He knew nobody else would do that to him, I guess.

Lage: Probably nobody else could do that.

Hedgpeth: Well, I don't know. Some people.

Lage: When others were inspired to do their own treatments, did they use the same organization as Ricketts? I noticed that he organized by areas.

Hedgpeth: Yes, or by levels, tides. Yes, not quite.

Lage: Were there troubles with that kind of organization?

Hedgpeth: Not necessarily. Depends on where you are. See, in Puget Sound, the tides are at much greater levels, much greater zonation, so it's easier to use the whole bay.

Lage: You didn't organize that way in your book on San Francisco Bay.

Hedgpeth: No, not too much. There wasn't much about the bay. The book was supposed to be short, and that time they just wanted small books. Now, they say I can spin that up to 400 pages. The latest one I heard from Art Smith was that they were going to be about 700 pages. That's going to be about all the environments, Bay Area, or maybe northern California, I don't know.

Lage: In your research on the *Between Pacific Tides* and Ricketts and all, what was Jack Calvin's role in the early edition?

Hedgpeth: He did some of the illustration, he did some of the photography, and I think he rewrote quite a bit. He had written two or three children's books on seafaring, and he was a pretty good writer. Ricketts had a peculiar way of writing at times, used words in his own sense and that sort of thing.

Lage: Was he aware of that?

Hedgpeth: I don't think he really cared very much. He felt it was the way to express himself, using some words in a slightly different context. Steinbeck complained about that. What Steinbeck did was to change those things. Ed said, "Well, he wrote much better than I ever could."

Lage: So Calvin did some rewriting?

Hedgpeth: Yes.

Lage: But Calvin wasn't a marine biologist himself, was he?

Hedgpeth: No, he wasn't. Well, he knew a fair amount, and he picked up a bit of it from osmosis. He wound up with a charter service out of Sitka for people who wanted to see some of the rarer spots, Sierra Club types who had full purses and that sort of thing. He was an irascible sort of fellow, and "everything you might have referred to may be true, but you didn't have to say that" kind of attitude toward--

##

Lage: You say he was an irascible sort?

Hedgpeth: Oh, yes. The last I heard of him I think was when I met Xenia Kashevarov in New York City, and Joe Campbell had kept up with these people all this time, since the 1930s. Xen ran a--may still do; I hear she's still living--she was curator of a textile museum in New York City. She's a small person, but she was one of the famous daughters of Father Kashevarov, the Russian Orthodox Priest in Sitka. Of course, I think he was a native Alaskan, too. But he was a great source of information on Russian history, and he had access to all of that.

He had about six daughters, and one son who was killed in an accident. The daughters were--one of them was Calvin's wife, Sasha. Tal was Ritchie Lovejoy's wife.

Lage: Now, Ritchie Lovejoy: who was he?

Hedgpeth: Well, he was part of the crowd. He did some of the drawings for Ed, he didn't do any of the writing. But he was an advertising writer, and things like that.

Lage: And lived near Cannery Row, or on Cannery Row?

Hedgpeth: Yes, he was part of the gang.

Lage: Did you know him?

Hedgpeth: I met him two or three times, yes. Didn't really know him. There were a couple more of these gals, and they all had the Russian proclivity for strong liquor. I don't know whether Xen seduced Ed--of course, that wouldn't take much doing. She was a teenager sent down to go to high school, and she wanted to find out what this was all about. She did.

And anyway, at this meeting in New York City, she was a little annoyed. She'd just got a Christmas card, it was toward the Christmas season, from Jack Calvin. The first thing he said is, "I have to tell you, your sister Sasha died a few months ago. I remarried and had a vasectomy." And she says, "This is a hell of a way to be told you're the last of your family, isn't it?" I have to agree to that. [laughter] She said, "The nerve of the guy at his age having a vasectomy!" [laughter] That's the way they always talked. But that's a very mild version of the way they talked.

"Philosophy on Cannery Row"--Ricketts, Steinbeck, Joseph Campbell

Lage: I notice there's a great deal of literature about the influence of Ricketts on Steinbeck.

Hedgpeth: Yes.

Lage: Were you in at the beginning of people starting to wonder about that?

Hedgpeth: No. I don't know; I met Steinbeck at Ed's place. I don't know what he was doing at that time. But shortly after that, he had produced *The Grapes of Wrath*, and the next time I came down there, Ed had the galley proofs. Stuck them in front of me and I read peripherally through them a bit. He thought the ending was great, and--.

Lage: And what?

Hedgpeth: I wasn't too sure about the ending. A lot of people haven't been since either. But he said right then when it was in galleys, he said, "It's going to win the Pulitzer Prize."

Lage: Did Steinbeck leave a strong impression on you when you saw him?

Hedgpeth: Well, by the time I had any really serious conversations with him it was after Ed's death. I was pretty well insulated from being impressed by people like that.

Lage: I read that Steinbeck had destroyed a lot of the correspondence between Ed and himself. Why do you suppose he did that?

Hedgpeth: Yes, he did that with a lot of people, apparently. There was one friend that he called on, a man who he had written a lot of letters to, and Steinbeck asked to look at them and dropped them one by one in the fireplace and said, "I don't think this one should be left around."

Lage: Do you have any theory about why?

Hedgpeth: No, I don't know why, except that he--. Perhaps they were franker than he wanted them to see in print.

Lage: What about Joseph Campbell? He was part of that circle for a while. Did you get to know him?

Hedgpeth: Not then. I didn't meet Joe until I went up to Oregon State. It was about '83, I guess, no, '73. Richard Astro was a professor of English then, or assistant prof, had gotten his thesis on Steinbeck. He wanted to--

Lage: And he was at Oregon State?

Hedgpeth: Yes. He'd gotten funding for a meeting on Steinbeck. Of course, he found out about me sitting out there at the beach, so he got me in on it.

Lage: How did he find out about you sitting out at the beach?

Hedgpeth: Well, I don't know, probably *Between Pacific Tides* or something like that. Anyhow, I tried to get Dan Mainwaring in on it, because Mainwaring and Steinbeck had met in Los Angeles at a course given by my old friend near St. Helena, W. W. Lyman, who had been born at the house just this side of the Bale Mill, and the creek there is known as Lyman Creek, and actually that should be Lyman Mill, as a matter of fact. But anyway, he was

always called Jack. He used to teach Celtic languages at Berkeley, and then UCLA, but anyway, he was a professor down at one of the junior colleges or state ones there. He had a meeting staged between Steinbeck and Mainwaring. Dan had written this novel about a farm workers' strike, same thing. His book was titled *One Against the Earth*.

Lyman introduced them as the two promising young authors who would make their mark in the state. Dan later said, "Well, he was 50 percent correct."

Lage: When was that meeting?

Hedgpeth: I don't know exactly [1933].¹ Anyway, we finally had Dan agreeing to come up with him, but he backed out at the last minute. He just didn't feel up to it. He had been away from all of this stuff so long. See, he wound up writing movie scripts and detective stories.

So anyway, we got a pretty good group together. A book on that conference is now out of print.²

Lage: Is that when you gave your talk on philosophy on Cannery Row?

Hedgpeth: Yes, right.

Lage: Was that before you had done *Outer Shores*?

Hedgpeth: Yes.

Lage: And when you gave this talk, "Philosophy on Cannery Row," is that what interested Richard Astro in looking more carefully at Ed Ricketts and his influence on Steinbeck?

Hedgpeth: Yes. Well, he wanted to figure out what influence he had.

Lage: Or had he already had an interest in that?

Hedgpeth: I don't think he really knew much about it until I started giving him information on the stuff. See, what I did was get Ed's notebooks. They were down at Pacific Grove. So I had them there, about five of them, great big ledger-type books. They

¹See Richard Astro, "Steinbeck and Mainwaring," *Steinbeck Quarterly*, vol. III, number 1, Winter 1970.

²Steinbeck and the Sea, Richard Astro, editor (Newport, OR: Oregon State University Sea Grant Program, 1975).

were in terrible scrawl, soft pencil, things he'd write in the middle of the night, you know.

Lage: And where were they?

Hedgpeth: They were in custody of Hopkins Marine Station. They have now been put in the Steinbeck Library at Stanford, which is kind of odd, because Stanford's faculty and the Stanford Press didn't think very much of Ricketts. They rejected *Outer Shores* because they said all those philosophical essays weren't good Ricketts. I tried to explain to them there ain't such thing as good Ricketts; there's just Ricketts, that's all. But they didn't like them because they were not--didn't show any real philosophic discipline behind them. That Stanford Press is--. Their only real good selling book was *Between Pacific Tides* through the years, so it's kind of funny that way, but anyhow.

After leading me on to write the book, they finally just dumped me, so I put it up there with the Mad River Press. Now it's out of print, and I am holding the copyright and trying to solicit tender letters of endorsement so I can approach--and just for the hell of it, I'll approach Stanford Press again, because now for a while they have had a managing editor, Grant Barnes, who was formerly the real book bringer from UC Press. He was senior editor for Stanford Press at that time. Things may have improved down on the farm. He seems to have brought them into the real world.

Lage: So maybe the timing is better.

Hedgpeth: Their inventory is definitely improving. Grant said, of course, that a lot of friends sent him titles for possible books to be published by Stanford Press, like *Fiscal Problems in the Reign of Genghis Khan* and such things, [laughter] the kind of stuff they were printing in those days.

Lage: "Philosophy on Cannery Row" seems kind of a seminal thing, at least if you're interested in Steinbeck and Ricketts.

Hedgpeth: Yes. It was about all I knew about the subject.

Lage: And what did you use as the basis of your research there? Did you get into his journals then?

Hedgpeth: Not really the journals, because they were more or less personal comments or little notes about what they did when, and complaints about some other things. Things he wrote about in the middle of the night. I think he had more or less permanent insomnia or something. He worked until late.

Lage: Was any of the Cannery Row philosophy influenced by Joseph Campbell, do you think?

Hedgpeth: I don't know. Campbell has always been a great talker. Of course, that was all back in the thirties. Ed did write a letter about "The King and the Corpse," which Campbell had obviously improved from the German version. Strange, he wrote so much about the Celtic aspect in mythology in that book, which was essentially based on Zimmer's manuscript. The last thing he wrote, one of the most recent ones, was an introduction to a big meeting on the Celtic temperament held in Canada, and he spent most of his time talking about Indian philosophy and dragging the Celts into that by the scruff of the neck. He said of course he had very good claims for Celtic background, since I don't know whether his grandfather or his uncle quite often led the St. Patrick's Day parade in New York on horseback--that sort of stuff. Of course, he was raised Roman Catholic, too.

Lage: When you did meet him, did he throw any light on Ricketts as far as you were concerned?

Hedgpeth: Not too much, no. I just met him several times in New York; after that meeting, I'd go by. He lived in Greenwich Village. Finally decided he was going to have to retire and move from there, asked about housing down near Esalen. "Well," I said, "for starters, you've got to have about \$750K to get a decent place down there." He allowed as how he'd heard that.
[laughter]

I had written a very vituperous letter to Stanford Press, after they wrote me a nice little note saying they'd decided, since I didn't have much more time to live, to count on for future editions, they were going to find a new editor, and so forth. I wrote a letter ending that I would hope to read the writer's tombstone by the light of Halley's comet. Well unfortunately, the comet wasn't brilliant enough to read a tombstone by anyway. He's still living. But that correspondence got posted between San Diego and Bamfield, which is way out in the wilds of Vancouver Island, by my various colleagues. [laughter]

Lage: After that conference on Steinbeck, there have been a couple of other "Steinbeck and the Sea" conferences that you've taken part in?

Hedgpeth: There was one in San Jose. I don't know whether I gave a paper at that one or not. There was one in May 1992 in Nantucket.¹ I was invited to be the keynote speaker and talk about Steinbeck as an environmentalist.

Lage: What was your thesis there?

Hedgpeth: My thesis was based on the last book he had published, which nobody has ever read.

Lage: Which one was that?

Hedgpeth: It was called *America and Americans*.

Lage: It was sort of a picture, photo book?

Hedgpeth: Yes. And had a series of short essays by Steinbeck scattered here and there through it. He had been asked to write an introduction. He thought it would take him two weeks; it took him several months. He wrote these little vignette chapters, and some of them are essentially an environmental statement on how we're going to the dogs, wrecking the environment, and all this kind of stuff, as well as some other things about morals.

I don't know what he would say to what I read this morning in the paper that the California schools' record for censorship is getting pretty bad. I think it's Benicia that has forbidden any book by John Steinbeck to be in a school library, any one of them.

Lage: None of Steinbeck's books in the library?

Hedgpeth: Yes. All books by Steinbeck forbidden. I don't know what the heck to say about *The Long Valley* and *Pastures of Heaven*. I don't know what Wallace Stegner would say about that, too.

Lage: I'm sure he'd have something to say.

Hedgpeth: Yes, no doubt.²

¹See supplementary papers to the oral history, The Bancroft Library. Proceedings in press with University of Alabama Press, to be published 1997.

²Alas, Wallace Stegner is no longer with us.--JWH, October 1995.

The Society for the Prevention of Progress

Lage: I don't know if this relates to Ricketts, although it seems to relate to some of his beliefs, but tell me about your Society for the Prevention of Progress. When did you found that society?

Hedgpeth: About 1944.

Lage: That seems ahead of its time, somehow.

Hedgpeth: Well, I showed a friend of mine who was in divinity school a statement I had cooked up about how the increase of material progress violates the lease granted to mankind by nature, or something, and he said, "Well, that's a very orthodox statement." [laughter]

Lage: How did it come about, and were there other people involved in the society?

Hedgpeth: Oh, people have asked to be members from time to time. There was a strange meeting in 1953 in Copenhagen. I was seated next to Erwin Stresemann, who was considered one of the world's great ornithologists. He had the general bearing of a Prussian field marshall, complete with monocle. We were discussing the business of nomenclature and how to control the names and prevent duplications and all that kind of stuff. It's really not the field of biology; it's a branch of Philadelphia lawyers or something.

Anyway, toward the end of the meeting, he leaned over, his monocle slipped off as usual, and he had to go around groping for it on the floor. He said, (in English), "What must I do to join the Society for the Prevention of Progress?" I said, "Sitting through this meeting for a week qualifies you for membership." [laughter]

Lage: Well, tell me what you experienced or observed that led you at that tender young age to start the Society for the Prevention of Progress?

Hedgpeth: Well, I wasn't so tender and young. After all, I was born in 1911.

Lage: Well, you weren't an old man. That would make you, what, thirty-three?

Hedgpeth: I was born in 1911.

Lage: Didn't you say you started it in '44?

Hedgpeth: Yes. Well, thirty-three. I'm eleven years behind the century; easy way to figure that out. Well, partly out of my experience in Shasta Dam and the debris dams.

Lage: What was that experience, with the debris dams?

Hedgpeth: See, the first assignment we had began in '38 working with the Corps of Engineers. They wanted to build a debris dam on the American River so hydraulic mining could be reopened. They'd selected a site north of the main fork of the American River about two or three miles above where the site of the now-unbuilt Auburn Dam is. One fine winter night, the site of the keyway (the excavation in the sides of the canyon for the dam) collapsed. They hadn't even started digging. The whole thing was unstable ground, where the engineers figured that it was a good dam site. And of course, at Shasta Dam the next year, we realized that that would be the end of the salmon.

Back then, 1939, we recommended that they increase the flow of cold water from Shasta to lower levels of the reservoir, which they have never done. And to add insult to injury, they built a dam on the Trinity and punched a hole through to the Sacramento drainage. That water comes into the Sacramento now. The Trinity is mostly dry. That's just a tributary to the Klamath.

[After the field work on Shasta Dam and the salmon runs, I worked at Stanford during the winter and spring working on the final report which became Special Scientific Report Number 10 of the Bureau of Fisheries [see following page]. We recommended that cold water be drawn from lower depths of the reservoir to help the salmon that could not pass the dam, but that has never been done. After completion of the report in 1941, the remainder of the team disbanded and I was unemployed. I was in an interregnum. I worked for a while at a menial job in a state veterinary lab in Sacramento that serviced farmers with herds. One day a tame billy goat was brought in, and I was asked to hold it by the horns while the examiner smashed its head until it died. There was quite a flap about that because it was a family pet, and the people did not realize the lab took samples for herd animals. I dimly remember that someone was called on the carpet for that.

I resigned from that place soon after Pearl Harbor and retreated home to Walnut Creek and became self-employed. I obtained several large collections of pycnogonids from the National Museum in Washington and other museums, and prepared two major monographs and several small reports on the material.

1940 Shasta Dam Salmon Study

The Bay Institute
OF SAN FRANCISCO

101 Embarcadero Way, Suite 120, San Francisco, CA 94111

VOLUME 1 / NUMBER 3 / FALL 1989

Page 2 Bay on Trial

Fifty-year-old report on saving salmon

Even before the completion of Shasta Dam, a Department of Interior Scientific Report¹ included recommendations to save salmon from releases of the Dam's stored water of lethally high temperatures. Fifty years later Interior Department's Bureau of Reclamation, which operates Shasta, is still refusing to provide the salmon protection. The Bureau ignored the report, shelving the recommendations and limiting its circulation, according to a member of the scientific team that wrote it. The fiftieth anniversary of *Scientific Report Number 10*, ironically coincides with the revoking of temperature protections from Shasta releases by the Regional Water Quality Control Board after pressure from the State Water Resources Control Board and the Bureau

Construction of Shasta Dam began in the Depression and was completed during WW II. Saving salmon, the jobs that went with them, or the river was not a legislative priority. Due in large part to Tyee Club agitation, eight men from the Bureau of Sport Fisheries and Wildlife (the predecessor of the U.S. Fish and Wildlife Service) began an eighteen-month-long study to investigate the possibility of saving salmon populations doomed by the dam. The construction of the 560-foot-high kingpin for the Central Valley Project (CVP) would eventually block the enormous salmon run of the Sacramento river.



Hedgpeth holding a 30-pound salmon at Anderson Cottonwood Diversion near Redding in 1939. Photo: Courtesy J.W. Hedgpeth

from the streams in which they spawned. The report gave options for possibly saving the runs, and outlined ways to maximize the "survivability" of the fish.

Dr. Joel W. Hedgpeth was then a junior aquatic biologist assisting Harry Hanson, Osgood Smith, and Paul Needham, the leaders of the study. Knowing the needs of salmon, the scientists had little hope that much natural spawning on the river would be preserved. The group completed field studies detailing the upper reaches of the McCloud, Pit, and Little Sacramento Rivers that would be submerged, as well as the number of fish and their total spawning area. Hedgpeth recalls the cold and the beauty along the upper reaches of the rivers that merged to form the Sacramento. "We identified the spawning beds, looking for golf-ball-size gravel, and roughly measured areas. Where we could, we crossed the stream, pacing off its width. Most of [what we identified] was destroyed when the dam backed the water up. [We] saw the spawning for the last time, as river flow was soon diverted for construction."

The second half of the report discussed options for saving the fish after the dam was completed. The options consisted of transplanting the fish to one of the creeks that feed into the river below Shasta Dam, building hatcheries, or improving conditions below the dam to allow for spawning between Keswick and the mouth of Battle Creek. In addition the report roughly estimated the value of the fish stocks. In a sense, Hedgpeth notes, it was one of the first environmental impact reports ever done.

The report didn't anticipate Red Bluff Diversion Dam, which kills thousands of young salmon, or the failure of Coleman National Fish hatchery on Battle Creek to make up any of the losses from Shasta. In the fifty years since the Dam blocked



Cottonwood Creek Courtesy Joel W. Hedgpeth

hundreds of thousands of fish, the runs in the upper Sacramento River have dropped more than 75%. The whole river has changed. "The Dam changed the natural cycle of the stream. It flattened out the natural variation of the stream," Hedgpeth says. In the past, he says, the spring run made up most of the population, because of the abundant river flow at the time of year. Now the fall run makes up the largest share of the total population. (The winter run was classified endangered by the State Fish and Game Commission due to the precipitous drop in population, which went from a high in this century 130,000 fish to just 550 in the spring of '89.)

"We submitted the report and disbanded," Hedgpeth says. "We knew [the resource] would go to hell." Few of the crew followed developments of the river afterwards, although most had successful careers as fishery biologists. The report did not predict that the Bureau of Reclamation would ignore science for 50 years. (See Shasta story on page 1)

¹ "Special Scientific Report No. 10, An Investigation of Fish-Salvage Problems in Relation to Shasta Dam," by Harry A. Hanson, Osgood R. Smith, and Paul R.

I did some book reviewing for the *San Francisco Chronicle* and other papers on progress and the history of oceanography, and so on. I was, of course, unfit for military service (4-F). In February of 1945 I was called by Gordon Gunter to assume employment at Rockport, Texas, with the Texas Game Fish and Oyster Commission (as it was called then) and set back on the trail to becoming a marine biologist. We conducted studies of the fauna (Gordon was an ichthyologist at the time) of the near shore of the Gulf of Mexico. We also experimented with oyster planting in the coastal bay as far south as the southern Laguna Madre of Port Isabel. It was a completely new world to me. I left Texas in June 1949.]¹

Lage: Did becoming a marine biologist have anything to do with the founding of the Society for the Prevention of Progress? I noticed that Ed Ricketts also seemed to have a sense that civilization was perhaps contrary to real progress.

Hedgpeth: Yes, but I doubt that it is peculiar to marine biologists. After all, you've got a game biologist like Leopold who, while he didn't ask to be a member, simply encouraged me on to it. I don't know whether I showed you that letter from Aldo Leopold.

Lage: No, you told me you've got a letter from him, but that wasn't recorded on the tape, if you--

Hedgpeth: It was virtually a letter of marque; I'll get you a copy. [See Appendix D.]

Lage: Now, this was 1947, a letter from Aldo Leopold, "Man Against the Land" was the article you wrote--

Hedgpeth: That was in the old magazine called *The Land*, which was run by Louis Bromfield and others who were gentleman back-to-the-land types. I contributed several articles to them.²

But anyhow, Luna [Leopold] looked at that, and he said he never knew his father had written a letter like that to anybody. [laughs]

Lage: That's an interesting reaction to it.

¹Mr. Hedgpeth added the preceding bracketed material during his review of the draft transcript.

²Reprinted in *Forever the Land; A Country Chronicle and Anthology*, edited by Russell and Kate Lord (New York: Harper, 1950).

Lage: What was the article in *American Scientist*? You came out against progress in the *American Scientist* [vol. 35 (3) 1947], he said.

Hedgpeth: Called "Progress--The Flower of the Poppy." [See Appendix E.]

Lage: Did you get a lot of reaction on that?

Hedgpeth: I got some reaction. I got some letter chiding me by one Florence Moog from Washington University, St. Louis. There was a big ad in the Sigma Xi magazine by the Moog Piston Company of St. Louis, so I asked her if she was related. She took off like a skyrocket and said, "How dare you insinuate I should be related to such people?" Well, good heavens, I just thought I had asked a routine question, natural. I was told later she was considered one of the queer ones on the faculty there, rather difficult.

Lage: Did you see yourself in this attack on progress as being part of a movement or a group, or just this was an idiosyncratic you?

Hedgpeth: No, just my own little idea.

Lage: Because it does seem--you have Aldo Leopold and others who are beginning to question progress around the same time.

Hedgpeth: Yes. He unfortunately died soon after that.

Lage: I know. He said, "I am pleased this is the forerunner of a book."

Hedgpeth: Well, I had a book started, but what happened was, I never got around to finishing it, and Ray Dasmann was writing *The Destruction of California*, and I sent him the rough draft, and he used some of the ideas. In fact, I think he says so in his preface.

Lage: Was that the thrust of the book you were going to do?

Hedgpeth: Probably something like that. Of course, Ray was a bit more ambitious than I was to get something out. He did a pretty good job. I'll have to go dig that other thing out for you.

Lage: So your society was a society without members, without official membership.

Hedgpeth: I wrote letters recommending people for membership. I had a lovely letter from C. S. Lewis.

Lage: Did you recommend him for membership?

Hedgpeth: I also got a note from his brother saying that thirty years' service in the British Army entitled him to membership. Where the devil is it here? I thought it was right in here.

Lage: Do all these letters of yours exist in your files?

Hedgpeth: I had those by Lewis in the back of a book about him, in a pocket I had built in it, and that book has disappeared. In fact, I had a letter from Richard Llewellyn in *How Green Was My Valley* and that's disappeared. I don't know why books with envelopes in them with letters--. I didn't think I had so many untrustworthy people coming in my doorway. Of course, it may be accidental. People have a way of borrowing books and never returning them.

Various Articles and Papers Noted ##

[looking at bound reprints of Hedgpeth articles]

Hedgpeth: Toward the end of my career at Corvallis John Byrne, now president of Oregon State (I think he was a dean at the time) said he thought it would be a good idea to publish a volume of my selected writings with the Oregon State Press, so I made a selection and turned it over to the person he considered a suitable editor. She was a faculty wife of Chinese origin, probably American born, but did not understand that some of the published selections should not be changed. She had several items retyped after substantial changes in style and substance. She also, with another person, wrote an introduction which was embarrassingly gushy (I had already asked Garret Hardin to write a brief preface). The Press did not have the funds for the job that year, and I took the project along with me when I left Oregon State. A while later I showed the project to Grant Barnes of the UC Press, and he wanted to accept it, but no funds there. He urged me to discard the girlish introduction as inappropriate, off key. Since then I have published several more suitable items, but have let the matter rest.

But here is the third volume, volume three of five volumes of my articles. You were asking me about the one on "Taxonomy,

man's oldest profession."¹ That was 1961. Of course, this book includes all the chapters from the treatise that I stuck in here too.

Lage: From the big red book [A Treatise on Marine Ecology]?

Hedgpeth: Yes. And various other things.

Lage: You have five volumes of these collected works?

Hedgpeth: Yes.

Lage: Some are very scientifically oriented, and some are more philosophical, it seems.

Hedgpeth: Yes.

Lage: And how does the philosophical view affect the scientific approach, or does it?

Hedgpeth: It doesn't really.

Lage: Does it affect the kind of problems you choose to look at?

Hedgpeth: No, not when you try to read Wittgenstein's junk. You can't figure out what he's driving at.

Lage: But your own outlook, I'm trying to get at how your own view of the world affected how you've gone about your scientific career.

Hedgpeth: No, not really.

This one was considered a very profound piece by one commentator who reviewed the whole book.

Lage: What was that?

Hedgpeth: Oh, this little thing.

Lage: "The Evolution of Community Structure?" [as yet unpublished; reviewed in manuscript]

Hedgpeth: Yes. That was a set topic, so I--.

¹Eleventh Annual University of the Pacific Faculty Research Lecture, May 22, 1961. See papers supplementary to this oral history, The Bancroft Library.

Lage: On approaches to paleoecology?

Hedgpeth: Oh, yes.

Lage: Paleoecology. Tell me what that is exactly?

Hedgpeth: You work with fossils.

Lage: So you're studying the ecology of past--?

Hedgpeth: Yes, you're trying to guess things with about 90 percent of your information missing.

Lage: Is that an approach that interests you, or--?

Hedgpeth: Well, I was asked to contribute to this book by friends of mine. Here's a couple of pieces of congressional testimony, this is. Here's a--somebody asked that this be included in the congressional record, lectures I made.

Lage: "Man and the Sea."

Hedgpeth: Yes. I recorded them mostly in Olema down from Dillon Beach.

Lage: Delivered over KPFA in 1964.

Hedgpeth: Yes, Steve Charter was a regular commentator for KPFA, and he asked me to work up a few lectures on the subject.

Lage: What were the themes here? Was this an environmental theme?

Hedgpeth: Well, no, it was mainly about the study of the sea, how it's done and who did it and that sort of thing. I also wrote articles for reference books.

Lage: What was this in? The World Book Encyclopedia?

Hedgpeth: Yes, they pester me every once in a while for updating.

Lage: You've written on the ocean for them?

Hedgpeth: Yes. I was paid extravagant sums of money for doing these things.

Lage: They do pay extravagant sums?

Hedgpeth: Yes, a couple hundred bucks for something that's just boiler plate. I'm trying to think where--Scripps--I wrote this very sassy note on population structure.

Lage: When you were at Scripps, did you say?

Hedgpeth: Yes. I wrote this as a Christmas greeting. I guess this is in volume two. Yes, my Scripps years were 1951 to '57--that was '54. I still get a request for a copy every once in a while. [See following page.]

Jinglebollix

Lage: While we are talking about Ricketts and all that, who was Jinglebollix?

Hedgpeth: [laughs] Well, I think he was a composite. The general demeanor is a description of Rolf Bolin, rotund, jolly face, and always smiling. Bolin was a professor of fisheries at Hopkins Marine Station for years. Ed Ricketts always called people he disliked or considered incompetent Jinglebollix.

Lage: Sort of a generic term.

Hedgpeth: His favorite victim of that term was William A. Hilton.

Lage: Now, who was William A. Hilton?

Hedgpeth: He was professor at Pomona for years. He was a horrible duffer. He printed papers which make no sense. He would describe an animal as, "The head is six centimeters and the body three millimeters long," stuff like that. He'd garble up complicated station numbers, latitude and longitude, so he got them in the wrong ocean, and that kind of thing. His specialty was writing about critters that live in damp logs, and his papers have driven entomologists to desperation and tears. We had to re-examine all his pycnogonids to be sure which they were. I corrected some of them, and Al Child at the National Museum finished the job. Because you had to do it. These were things that were in the literature with names, more or less with qualifications of legitimately described species.

Lage: But Ed had run across them too?

Hedgpeth: Yes, in the same kind of amateurish way. Hilton was a very enthusiastic teacher and his students loved him. He went out on field trips fully dressed with a necktie on, and he would lead off the collecting into the tide pool. The tide pool turned out to be deeper than he thought it was going to be. Presently all you could see was his head and his necktie floating above water. I owe that description to Ted Bullock, of whom you may have heard.

An Example of Hedgpethian Humor

As published in *Systematic Zoology*, Vol. 8, No. 4, Dec., 1954Reports on the Dredging Results of the Scripps Institution of Oceanography
Trans-Pacific Expedition, July-December, 1953I. The Pycnogonida
by
Joel W. Hedgpeth

Introduction. On October 23, 1953, the MV *S. F. Baird*, engaged in marine biological and other scientific investigations in the waters of the North Pacific under the direction of Dr. Warren S. Wooster, executed a successful dredge haul in 710 fathoms. Among the material brought to the surface was one large pycnogonid. It is the purpose of this report to discuss this interesting capture and its significance to science and the welfare of mankind.

Systematic discussion:

Family Ammotheidae Dohrn, 1881
Genus *Ascorhynchus* Sars, 1877
Ascorhynchus japonicus Ives

Ascorhynchus japonicus Ives, 1892; Loman, 1911; Ohshima and Kishida, 1947; Hedgpeth, 1949.

Material collected: TransPac Station 4, 33 degrees N, 134 degrees 55' E, 710 fathoms, muddy bottom, 1 male; October 23, 1953.

This fine specimen extends the range of this species some 40' south and 3 or 4 degrees west of previous records, but well within the bathymetric range for this characteristic Japanese species.

General remarks: It is of particular interest to compare this dredging result of the Trans-Pacific Expedition with that of another recent expedition, the Swedish Deep-Sea Expedition (Fage, 1951). Although not the same species, both expeditions agree in having caught the same number of specimens, to wit, one (1). It must be pointed out, however, that here the similarity ends, as indicated by the results of a detailed statistical analysis (Table I).

TABLE I

	SWEDISH DEEP-SEA EXP.	SIO TRANS-PAC EXP.
No. successful dredge hauls.....	9	3
Total no. of pycnogonids collected.....	1	1
No. pycs. per haul.....	0.11	0.33
Months at sea.....	14	5
No. pycs. per month.....	0.07	0.20

As can be seen from this table, our expedition was three times as successful as the Swedish Expedition, both in terms of catch per unit of effort (as time away from port) and catch per unit of gear. It must not be thought, however, that this means that our fishing methods are so vastly superior to those of the Swedes. The only justifiable conclusion, and one that cannot offend any national sensibilities, is that the total pycnogonid population of the overall world ocean has increased threefold since 1948. At this rate of increase (i.e., about 60% per annum) it is estimated that the pycnogonids may support a major fishery sometime in the next millenium.

PERTINENT LITERATURE

FAGE, LOUIS. 1951. Sur un pycnogonide de l'expédition Suédoise des grands fonds, 1947-48. *Reports Swedish Deep-Sea Exp.*, 2, Zoology no. 7.

HEDGPETH, JOEL W. 1949. Report on the Pycnogonida collected by the Albatross in Japanese waters in 1900 and 1906. *Proc. U. S. Nat. Mus.*, 98:233-321, figs. 18-51.

My most popular paper — I still
get requests for it after 40 years!

Lage: And Bullock had the occasion to be on one of these field trips?

Hedgpeth: He was a student at Pomona. Pomona, of course, is a pretty good private school, or it has been.

Lage: So those two together you think were the Jinglebollix?

Hedgpeth: Well, I think the name--the first time he used it that I know of was in reference to Hilton, but he used it in reference to two or three other people. I think Steinbeck made a composite character out of several. So it was after Ed was gone that Jinglebollix really appeared in *Sweet Thursday* [John Steinbeck, 1954], and not exactly in Ricketts' sense as an irritating duffer.

Lage: Not too many scientific professions have had the sort of romantic popular account of themselves as marine biologists did in *Cannery Row*. Did this do anything for the field?

Hedgpeth: No.

Lage: Did it encourage young people to think this is a great field to get into?

Hedgpeth: I had a weird letter from somebody saying he was writing a paper on water problems, seemed to be a mixture of Ed Ricketts, Luna Leopold, and this mad Swede who described properties of water that were more mystic than actual, but also some things which were very good. Unfortunately, his book was translated into German, or maybe it was into Swedish, and then into English, so two steps in translation, leaving you to wonder what he really tried to say, especially when he gets kind of squishy anyway.

Lage: And he was going to write a book that was a mix of all these things?

Hedgpeth: He was going to write an essay for an op-ed piece, so he wrote to me. I haven't heard from him since.

Lage: Well, that didn't develop into anything.

Hedgpeth: These are all characters around P.G. [Pacific Grove], always going to do great things and leave great new paths and all that stuff, and never materialized. So you get to where you don't trust them too much to deliver.

I remember one fellow up in Oregon, somebody living out in the woods, sent me about forty pages of philosophy, wanted me to appraise it and thought it was ready for publishing. I looked

at it, and I wrote a note saying, "It shows a lack of appreciation of what has been thought of in philosophy, especially pertaining to where you're trying to go. Enclosed, a spare copy of John Stuart Mills' collected essays which may help you." I got an indignant letter back saying, "How you insult me, asking me to read some old ancient book like that!" And what the hell! It was not a very thick book. But a reaction like that indicated such a completely closed mind; it didn't seem worth carrying on any more. So I pocketed his return postage. [laughter]

Lage: All right. I think we have run out of steam for today.

Ed Ricketts' Innovative Work

[Session 4: October 1, 1992] ##

Lage: Last time we started this topic about your professional career, the making of a marine biologist. One of our topics was Ed Ricketts and *Between Pacific Tides*. I wonder if we got, or if we could get, a general statement of your assessment of the influence of Ricketts and this wonderful book on Pacific Coast marine biology.

Hedgpeth: I think I gave you a copy of that lecture I gave about him, didn't I? First Ricketts Memorial Lecture [see Appendix C].

Lage: And you've made some remarks in your forewords to the revised editions of *Between Pacific Tides*?

Hedgpeth: Yes, and Phillips [the new editor] is doing some remarks in the last edition of *Between Pacific Tides*. He reviews the whole history of the book. You see, the interesting, curious thing about Ed is that he was always perusing the recent acquisition department of the library, looking at all the new journals and books. He did that quite regularly. He spotted this interesting discussion by a man named Cabrera, an Argentine paleontologist, who made the more or less flat outright remark that two species with a closely related ecology will not occupy the same place. They become competitors for their ecological niche. It is called competitive exclusion, or something like that, and that became what is often known as Gause's principle, and that's been one of the major doctrines, so to speak, of ecology, at least of community studies and things.

Ricketts commented on that principle of competitive exclusion and other ecological matters in a preface to *Between Pacific Tides*, but it was deleted at the suggestion of Walter K. Fisher, who said it was a lot of junk. Old Fisher was an old-style systematic biologist. He described species very well. He worked on curious little worms. Toward the end of his career, he became quite a devoted amateur painter, and painted a lot of portraits.

But the main thing about *Between Pacific Tides* was a discussion by more or less ecological occurrence in relation to the relative tide levels in which they were most abundant.

Lage: So he organized it by ecological group, rather than by--

Hedgpeth: Yes. Well, primarily by environmental groups.

Lage: Was that a departure from the usual way of organizing it?

Hedgpeth: It was the first time that was done. It wasn't exactly a departure.

Lage: Well, it sounds like a departure, if it was the first time it was done.

Hedgpeth: Yes, well, it was an innovation. Because most sea shell books would discuss things--well, by rocky and sandy shores, and things, but he got more specific. What level of the shores that some things occurred and didn't occur in other places. So there was a lot of original observation in his collecting. He was always careful to note where he got things, and his field notes, by the way, are in Stanford library now, and you can get an idea from that if you want to pursue the Ricketts matter, how he conducted his business. Except most of his business records are in the University of Florida.

Lage: Too bad these things are divided.

Hedgpeth: Well, what happened was that I was in Texas when Ed had his accident, and I didn't come back until the following summer. In the meanwhile, Peter Lisca appeared at Hopkins Marine Station and looked through this stuff, and asked permission to borrow it. So they let him take a lot of stuff, and I feel he's gone nuts now. He's gone through three wives and--

Lage: He's still around?

Hedgpeth: He's still around. He sort of sits around on the lawn waiting for the crocodiles to eat him. Or alligators. Anyhow--they're different animals, by the way.

Lage: And Lisca took those papers to Florida?

Hedgpeth: Yes, he took them to Florida. We tried to get hold of them. In fact, he offered to give them to me one time, and then changed his mind when the people started reviving or stirring up Steinbeck, which was partly the result of what had happened at Oregon State, that held the first Steinbeck conferences. So I was down at Tallahassee giving a series of lectures, and I went over to Gainesville. A colleague of mine drove me over there. I stayed overnight, spent all day Sunday in his office. I went through his files and I itemized them. I noted what was in them and what was not in them. Of course, you realize that Ricketts' way of doing things was to run several carbons of letters and send them around to people, and anything he thought was worthy ideas, he would rattle off on his typewriter several copies. So there were a lot of files of Ricketts around. I don't know where some of them are now; probably gone.

But anyway, I sent Lisca copies of two of the essays which were most interesting, and his dizzy graduate student, I don't know where she is now, probably working for some fast-food joint, McDonalds or something, but I don't think she really got a decent job--there was correspondence, it was Ricketts' copies, indicating he had received some kind of an account from Joseph Campbell, and he'd known him in the old days. They found out when they looked in the recent biographies of Campbell. And I asked for a copy of Campbell's letter, with Ricketts' comments on it. She said, "You can't have those, because they're central to my thesis."

My reaction to this was to send a copy of the letter to Joe [Campbell], and I said, "Did you give this gal permission?" He wrote an indignant letter to her pointing out it's a very serious matter to deal with a person's correspondence that way, and so forth. Sent me a copy of his letter.

Lage: Did you ever get the letters, though, from the graduate student?

Hedgpeth: Yes--no, not from her. Joe sent them to me. I knew Joe Campbell; she didn't know that, see. She found that out the hard way.

Lage: You mentioned Gause's principle, and I remember you made the remark in one of your papers that the failure to include that section of Ed's work set back marine biology.

Hedgpeth: It did, because once that came out in explanations and somebody had tried to demonstrate it by raising pairs of species in similar situations, so that there was experimental proof of this, everybody got excited and started looking at these things in a slightly different way. So if Ricketts had been able to do that in the book, it would have made the thing much more of a classic than it was.

Lage: But it certainly has had a long life. How many times did you revise it?

Hedgpeth: Four times.

Lage: Was that a major enterprise?

Hedgpeth: It wasn't much, too much. Just going through and fixing it up here and there, and adding new illustrations and a new section in the back--two eventually.

Lage: Many new animals that were discovered along the way?

Hedgpeth: Yes. Things change names all the time, too. So anyway, a few years ago, they wrote me a sweet little letter saying that they wanted to find a new editor who at least would show promise of surviving a few more years than I probably would. Anyway, it was not very tactfully put.

Lage: [laughs] It implied your imminent demise?

Hedgpeth: Yes. So I wrote the guy back a letter and said I hope to read his epitaph by the light of Halley's comet. Unfortunately, the comet was a fizzle this year, this time, so he's still alive anyhow.

Lage: Well, maybe next time it comes back.

Hedgpeth: I don't know if I'm going to make it next time. What is it, a hundred--ninety years or something?

Lage: You'd be pretty ancient.

Hedgpeth: Well, the physician says I've got--the cardiologist thinks I'll make ten. The surgeon is a little more careful.

Lage: He doesn't like to make bets on people?

Hedgpeth: Well, he told me that I had probably a 75 percent chance of surviving. I thought about that, but I didn't tell him that, I

figured it out. The casualty rate of Picketts' Charge is 54 percent, so that's a little better odds. [laughter]

So anyway, the last time I saw him--I had given him a copy of *Poems in Contempt of Progress* before the operation. He told us that he told his wife, "By god, this guy is going to survive!" [laughter] I don't know really how to take that. Except I ought to drop by this afternoon and give him a copy of the latest edition of *Between Pacific Tides*. He's got his waiting room adorned with sharks and porpoises and--

Lage: Oh, you went to the right man!

IV BEGINNING A CAREER AS A PROFESSIONAL BIOLOGIST

An Introduction to Pycnogonid Studies

Lage: Let's go on, if you're ready for this, to your study of the sea spider. I read that you were an acknowledged expert in this animal by the 1930s. Is that true? That seems early in your career. When did you become an acknowledged expert?

Hedgpeth: Yes, "Man's Oldest Profession." That includes at the end a bibliography of my writings on the subject.

Lage: Well, the first one's '39. How did you get involved in studying pycnogonids?

Hedgpeth: It was kind of silly. I was a T.A. in junior college. The lady who was teaching zoology was a rather strange person. She'd gotten her degree from [Charles A.] Kofoid on a very slim thesis. I looked it up; it was about an eighth of an inch thick, *Some Events in the Life of a Soil Amoeba*, or some such funny title. Naturally, one suspects when a female gets a Ph.D. with such a flimsy thesis that something else might have been going on. But we won't go into that, because that would be scandalous and libelous anyway.

But anyhow, I was the teaching assistant--

Lage: She was a professor at the junior college?

Hedgpeth: Yes, San Mateo. A number of us in our neighborhood in San Leandro were attending there, so we went over together for a while during the first year. Then my mother moved over there and rented an apartment for us.

Anyhow, she said she wanted twenty-five starfish by next Monday or Tuesday. Nominally, I was more or less under the

other guy, Dr. Klyver. He said, "Did she say anything about paying you?" I said, "No." He said, "Well, we've got a budget, get transportation and cost of those things from her for her course." She was kind of annoyed when we figured out that seventy-five cents apiece was a good price for twenty-five starfish, to say nothing of traveling over the hills and far away.

Actually, what we--there was a great big rock that at high tide was completely separated from the shore about twenty yards from the bluff. One of my friends who wasn't taking the course and I went out there--it was his car; I didn't have one then. At low tide we saw all these starfish plastered on the side of the rock, so we just leaped out with great joy and grabbed them, and then we started looking around a bit, seeing what else we could see in the seashore. Grabbed bunches of hydroids and things, put them out in a pan. A spider-like creature shambled off; it was a pycnogonid.

I had already read something about them in a book by a man named Crowder, who was a New York advertising man. His book had been for sale for a dollar in the local drugstore, of all things.

Lage: In this drugstore?

Hedgpeth: Yes. I don't know why. So I got interested in them.

Lage: What are they like, and what is it that interested you?

Hedgpeth: They don't look like anything else on earth. They don't have any body; they're just legs, and walking around. I have pictures of them someplace. [looking through papers, notes]

Lage: And how large? There's a great variety of them.

Hedgpeth: Oh, yes. Some of them get this big--

Lage: Now, when you say that big, that's about nine inches across?

Hedgpeth: Yes.

Lage: Well, those are two pictures. Is there a particular fascination about them, aside from these leggy--?

Hedgpeth: The young fed somehow through the tegument of the father. See, the male carries the eggs around until they hatch. That apparently is not so.

Lage: What did Crowder say about them?

Hedgpeth: He said that's what he thought happened, because they all died at once. I think they died once his aquarium went bad.

Well, that was one thing. Of course, my professional career didn't begin until 1938. See, I was born during the Depression. In '33, you couldn't get a job. I spent a year in graduate school, more or less aimless. That's when I started to write the first paper about them, I guess. But anyhow, so then about '35 or '36, I was taking this federal civil service exam, had a job for a year in Washington as a clerk in the Treasury Department, which was about as boring as Walt Whitman found it, I think. Not that that was any great historical precedence.

So after trying to winter in Washington alone with a bad case of bronchitis, I decided I wasn't interested in living in Washington, D.C.

Lage: But you did some research while you were there, didn't you?

Hedgpeth: Well, yes, I went down to the National Museum, since I was on the swing shift.

Lage: What were you working on there?

Hedgpeth: Waldo Schmitt had given me a bunch of crabs and things to sort out.

Lage: Wasn't it Waldo Schmitt who suggested that you could help Ricketts with the pycnogonids?

Hedgpeth: Yes, that's one thing. He introduced me to Ricketts by mail, because I was interested in looking at them, but they didn't have any around there to look at at that time. Subsequently, they found bushels of them, after I once published a couple of papers.

Lage: Did your papers have some influence in interesting others in the field in looking at these little animals?

Hedgpeth: Well, according to Bill Fry, they did.

Lage: Was he accurate?

Hedgpeth: Yes, I guess so. Kept grinding them out. Of course, now this guy in Holland, I just sent--he's published 400 papers. They're not all on pycs, though; I think about half of them are some other subject. But he just retired, and he's still grinding out

papers. His name is Jan Stock. And then Al Child at the National Museum started out with some advice from me, and we got a joint paper out together, and he's gone on. He's been grinding them out too. I have to look at them all and see what I can make of all this. There seems to be no end of new kinds you can find.

Lage: So the papers are partly discovering new examples?

Hedgpeth: Of all the literature of this group, about 90 percent is systematic, just description of species.

Lage: And what has been your primary interest in them, or has there been a primary interest?

Hedgpeth: Well, I didn't have any particular primary interest, except I was always interested in getting a little more information about geographical distribution, significance and so forth. So anyhow, we worked that out.

Lage: I notice one of these articles that you wrote for this 1976 meeting had to do with locomotion.

Hedgpeth: Yes. You see, these animals are rather peculiar in that there are some which have an extra pair of legs, and even a few more kinds which have two extra pairs of legs--in other words, they have twelve legs. They don't move like centipedes, and we were figuring out what kind of pattern of leg movement they might have. Of course, it's to be suspected they did have some kind of synchronous movement, so they wouldn't get tangled up with each other. So I had a couple of students down in the Antarctic taking movies for me, and we eventually got that written up. It's part of the paper in here by Schramm.

Schramm, incidentally, is now working in Amsterdam. He was curator of paleontology at San Diego Museum and the trustees decided they had too many people doing things that didn't interest anybody, so they fired him. They fired about five people. Fred couldn't get a job anywhere in this country, so he accepted a job in Amsterdam.

Lage: But he is American?

Hedgpeth: Yes, and he speaks English. I told him, "Well, I hope you'll learn a little Dutch in two years, but they don't worry too much about it." Enough, I suppose, to give a graceful introduction or suitable statement at a commencement.

Which reminds me of T. A. Stephenson when he was professor at Aberystwyth. He came from South Africa and rather fancied that he really should be at Oxford or Cambridge, not in a tidewater, second-rate place like the University College of Wales. So anyway, came time, according to his secretary, for him to take part in some official ceremony and present an award or mention an honor, and to do that, it would have to be done in the Welsh language. So they handed him the text of his speech, four or five lines long or something. He practiced it, and then down amongst the lower life, taxi drivers and so forth, he got a bit of coaching.

Finally got brave enough to try it out on his secretary. She said, "Well, you're doing pretty well, but I'm afraid they've given you the wrong speech." [laughter] He was so happy the day I called on him; the Yugoslavs had just won the international choral competition, so the way Welshmen think they're too good and don't practice enough, or something like that. He was quite happy. It made his day.

Lage: Have you made a lot of collecting trips in connection with the pycnogonid?

Hedgpeth: Not too many.

Lage: Have you gone to the Antarctic on it?

Hedgpeth: Yes, I've been to the Antarctic three times. The rest of the places I've been to I haven't seen--not much opportunity to collect. But there are people collecting all the time, and they send them in to the museum.

Lage: And then you tend to look at what they've collected?

Hedgpeth: Yes. Look at it, and see what we can make of it.

Evolution of the Treatise on Marine Ecology and Paleoecology

Hedgpeth: I really didn't start as a professional biologist until 1938.

Lage: What marks the professional biologist? That was the first job?

Hedgpeth: Yes. I was on the civil service roster. They were getting together a field team. That was the salmon study's first year, 1938, on the American and Yuba Rivers--

Lage: At the Army Corps of Engineers.

Hedgpeth: And this is in connection with the idea to build some big dams for hydraulic mining to stop the debris. Turns out this doesn't work very well, so those dams were never built. The big one on the Yuba, that's for another purpose. Some of the sites we looked at, we have to have a dam on them, like the American River, of course. What's being talked about now is something for flooding and irrigation, not mining. So they have to be much bigger, and there's been yapping about Oregon--Auburn Dam--ever since.

So anyway, we got together a field crew; it was got together by random.

Lage: You're looking at a scrapbook now; is this relating to that study?

Hedgpeth: Yes, this is the first gang. The reason for mentioning this at all was that here is where the Treatise on Marine Ecology, at least my part, had its beginning. This man, Gordon Gunter, who came here, is from Louisiana by birth, from Natchitoches.

Anyway, Gordon was in Texas this time working with the Game Fish and Oyster Commission. This fellow George Giles [refers to scrapbook] was on the civil service rolls from way back. He didn't know any biology, but he was a veteran of World War I. And here we were all summer, working at going down rivers in rubber boats--

Lage: Which rivers did you go down?

Hedgpeth: The American and Yuba, and various branches. He didn't know how to swim. Near drowned.

Lage: Was he useful in your study?

Hedgpeth: No, not very. He was just along. He helped out with keeping us from getting lost in the woods, at least for two of us. Actually, an interesting part about it, much of this thing took place in country where I'd lived as a kid on Clipper Gap in the American River. In fact, we passed the house we lived in there.

Lage: That must have had some special meaning for you.

Hedgpeth: Yes, it did. I took a picture of it; I don't know where it is now. Funny.

Lage: And Deer Creek; is that Ishi country, Deer Creek?

Hedgpeth: Yes. I was stationed there for a summer. That's why I wrote an article about Ishi. It's back here, I guess. [flipping through pages]

Lage: What was Gordon Gunter's background?

Hedgpeth: He was a fishery biologist and naturalist. He was a very good naturalist. Worked on Texas shrimp and fishes. What had happened was he was working at Rockport, which is near Corpus Christi. In that area, there's been interest of geologists or paleontologists for a long time, because they're right backed up on the Texas--the edge of the plateau, you know, the Austin chalk and all that stuff. It's very highly fossiliferous and quite rich, and there's a lot of papers and discussions of it. So Harry Ladd from the U.S. Geological Survey came around, wanted to look at that environment and the fact that it was a hypersaline environment he wanted to look at, the Laguna Madre. So he came down there, and he got Gordon, who led him around, pointed out places.

##

Hedgpeth: The standing committee on paleoecology, ecology of past times, was set up in 1935, I believe.

Lage: Was paleoecology an old field, or was that something new?

Hedgpeth: No, it's not very new. It's been popular in Germany for years. This was a committee on paleoecology for the National Academy Research Council. [flipping through pages] Then you got a bit more formal, some of the same dramatis personae. Somewhere, Harry Ladd got in on this. He was a paleontologist for the Geological Survey.

Lage: Were you involved in any of this, or are you just showing me the history?

Hedgpeth: No, I'm just showing you the history briefly. [See Appendix F for Treatise foreword and contents.]

Lage: Here's Harry Ladd.

Hedgpeth: And now, you see, he's gotten a little more pretentious. Ladd was the chairman of the committee or subcommittee.

Lage: Now it's called the Subcommittee on Ecology of Marine Organisms.

Hedgpeth: Yes, but now look at what was happening here. Here's Roger Revelle, and T. [Thomas] Wayland Vaughan. Vaughan was director

of Scripps at that time, and he was primarily a specialist in coralline foraminifera and things like that, so these grand old --see, they kept on going for years like this, getting together and having a buzzy time--

Lage: And are these good papers that are being published?

Hedgpeth: Well, these are preliminaries. But here it's gotten a little more simple. Now suddenly Gordon appears on the scene.

Lage: Okay, this is 1942.

Hedgpeth: That's because Ladd put him on the committee. See, Ladd is chairman. He'd met him and thought maybe it would be a good idea to have somebody like him. So that was that.

Then, along came--well, let's see, "The Ecology of Marine Organisms," one, two. So they decided that they would have to publish a monograph on this subject. Now, this was the National Research Council, that's related to paleontology number five. Ladd is still chairman. I knew nothing of all this.

Lage: So we're up to '45 and '46. These are the war years, they're still--

Hedgpeth: That's right, and they were still rattling around.

Lage: In '49, they're talking about a committee on a treatise on marine ecology and paleoecology, so it seems they've decided to publish a book. Were these monographs the beginnings of the work to be included in the Treatise?

Hedgpeth: Yes, and they started writing things before that. So they were fiddling around, and Gordon sent me a draft of what he was writing. At that time, I was rattling around as a doctoral candidate at Berkeley.

I was sitting there in the Berkeley library, of course, and I said, "You missed a lot of things. I can find this by browsing on the shelves in no time. You really ought to have somebody full time to do the job of editing this thing, and carry it on, for you'll never get it done this way."

Lage: Were you thinking of yourself?

Hedgpeth: No, I was not. Really. I hadn't quite thought of myself as a full-time editor; after all, I was trying to get a thesis done. So they appointed me to the committee.

Research Biologist at Scripps Institution of Oceanography and
Editor of the Big Red Book

Hedgpeth: Now all this time, until I think he became director of Scripps, anyway, I don't know whether Revelle was on the committee or not--

Lage: He seemed to be on the committee.

Hedgpeth: Well, he was the earlier one, so he knew all about it. He wasn't on this. We had a couple of out-and-out strange ones, like Earl Myers, who really didn't know much. Yes, Roger Revelle was vice chairman for oceanography, so he had sidestepped a little of the main problem. But he was responsible for getting me on the payroll. The Office of Naval Research is what they applied to for a grant. So I was kind of in a funny position: I was there on an outside-supported payroll, though I nominally held a rank as a research biologist at Scripps, but I was responsible directly to the director, not connected with any department.

Lage: The director of Scripps?

Hedgpeth: Yes. I didn't learn until years later that Martin Johnson, who was one of the authors of the big tome on oceanography, *The Oceans*, by Sverdrup, Johnson, and Fleming, expected that he was to be in charge. That never got to me until after I left. I don't know why, but anyhow. So it took me about five to six years.

Lage: Did they anticipate that it was going to be a five- to six-year job, or did you anticipate?

Hedgpeth: I didn't anticipate it was going to be that long, but I knew it was going to be several years. I said, "The first thing is that there are a lot of people working abroad who have more to say about this sort of thing," and they wanted to discuss some environments like the Baltic Sea and the Black Sea and so forth. So I knew the people who knew most about this sort of thing--

Lage: How did you know so much as such a relative neophyte? You had just recently gotten your Ph.D., and you seemed to have a great grasp of the whole.

Hedgpeth: Well, I just started looking through the journals and seeing what was being done. All the journals everywhere in the world. Berkeley, you know, had big stacks of journals from everyplace

that had an acceptable language. Some of them were unacceptable.

Lage: How were your own language skills?

Hedgpeth: Not that good. I could read German and French.

Lage: Any Russian?

Hedgpeth: Rather feebly--enough to know what was in the Russian literature, but that was simply scanning it. I only took a semester of Russian from somebody who should never have been asked to teach it. He was a fine professor to talk dreamily about Pushkin and War and Peace and Anna Karenina and so forth, but not to try to teach a language. He would sit there and ask us to read a sentence or recite it or try to write it and say what something meant, and his poodle usually sat on a chair to his left. One day, Mrs. Kaun came there, and the poodle had to take the other chair. She sat there knitting.

Lage: This was his wife?

Hedgpeth: Yes.

Lage: What was his name?

Hedgpeth: Alexander Kaun. But the result was, we didn't learn much Russian.

Lage: But you had some.

Hedgpeth: Yes.

Lage: It seems essential, as you describe what you were trying to do, that you had languages.

Hedgpeth: Yes. Well, the language of paper titles is relatively small, so you can learn that in a few days. All you have to do is learn to read the Cyrillic alphabet, which was no problem to me, since I had worked as a printer during the Depression. For a while, I had a job in a print shop, and I would do some fooling around with a little printing press for years.

Lage: Tell me more about the big red book. I've heard it referred to as the big red book.

Hedgpeth: Yes. Well, I said, "You've got to get some other people interested in this, and since we don't know those environments, we ought to have the people." One of the things I did in 1953,

I went to the Zoological Congress in Copenhagen. That was the first big international meeting in Europe after the war in which Russians appeared in any numbers, and they had quite a contingent there, including the guy who was to write the book which was to be put into English, and that was partly my doing, I think. He was always writing terrific big books; I don't know whether he wrote all of the words himself or not, but he got them out. His name was L. A. Zenkevich.

So I tackled him right there at the meeting and said we wanted to have a chapter on the Caspian Sea, and he agreed to it.

Cold War Concerns of Naval Intelligence at Scripps

Lage: How did the working relationship with Dr. Zenkevich go?

Hedgpeth: Oh, fine. It had certain little interesting by-effects. Of course, Scripps was still deeply in the Cold War, classified up to the hilt.

Lage: You mean even the area of Scripps you were working in was classified?

Hedgpeth: Well, the whole darn institution. You could hear so much at seminar to put two and two together.

Lage: How did that affect the climate of working?

Hedgpeth: It didn't affect the climate of working with each other, of course, so much. Internationally, there were slight repercussions. I got a call from some young character from the Office of Naval Intelligence. I knew that they were carefully looking at stuff, because writing a chapter of a book entails sending things back and forth, haranguing over meanings and things, and someone forgot to mention this one or that, or something like that.

So he said, "You're getting an awful lot of heavy mail from the Soviet Union." I said, "Oh, yes, we are preparing this international treatise. We're having this Russian write the chapter on the Caspian Sea, since nobody else has as much access to it as he has." To say nothing of all the very extensive literature that had been piled up on it. I said, "Actually, it's being funded by the Office of Naval Research." Nobody had apparently told him that; he was--"Oh, well, well--."

I pulled out this text, and the last thing I had gotten, which had probably prompted his visitation. I said, "You can take this along and read it if you want to." This was the English version, about eighty pages of stuff. "No, that's all right." [laughter]

Lage: He didn't care to--

Hedgpeth: He said, "You're getting a lot of stamps on this mail, aren't you?" The Russians just loved to plaster their mail with all kinds of different fancy stamps. It had about twenty on it. I detected something from the tone of his voice. I said, "Our grandchildren may collect stamps someday; I'm saving these for them." He said, "Oh, that's all right," kind of sadly.

Then he looked at this and he started to swear. I said, "What's the matter?" Well, they had a stamp of a domed tent with outside guy wires, and little flimsy metal poles around it, on an ice island in the Arctic Ocean. He said, "We're using the same tent, but ours is classified."

Lage: And theirs was on the stamp! [laughter]

Hedgpeth: Yes. I got another rise out of this guy when we had a big international meeting at La Jolla, and I was asked to be one of the commentators on a bus full of people touring San Diego. They expected the Russians to come along. What we got instead was the official interpreter from the State Department, who was a New Yorker who spoke more Yiddish than Russian, apparently, judged from comments that came back to me, and a covert guy from the CIA who was a longstanding personal friend of mine. He told me there that he worked for the CIA--

Lage: You hadn't known it?

Hedgpeth: --as a desk authority on Russian--no, I hadn't known it. I knew he knew the Russian language very well. As this built up, I told the organizer, "These two people aren't marine biologists that we know about." I had a very good friend who was extremely competent in the Russian language; son of an old Czarist diplomat, in fact. He was a professor of zoology up the coast a ways. "We ought to invite him, so we can find out what's really going on."

So we had these three characters, so all they could do was speak Russian to each other. There weren't any Russians.

Lage: No Russians came?

Hedgpeth: That's right. I was told later by one of them that trips abroad were predicated upon having published a stated number of pages in the preceding year. A stall-out in the state printing office could fix these guys, if that was the case, if nothing else.

Well anyway, we got out to the head of Point Loma on this tour, and somebody said, "What's all that over there?" We could see across the channel to the navy airfield right behind the Hotel Del Coronado. I said, "Well, that's a military airfield, and those are ammunition bunkers you see around there. You can find a map of this in the latest issue of the Russian Fisheries Gazette."

Well, this brought my little pal in the Office of Naval Intelligence out. "What do you mean by making jokes like that? This is no joke." I said, "San Diego, of course, is a major tuna port. The Russian Fisheries Gazette has a big article about it, and they happen to have a map of the whole San Diego harbor with all the things that are blanked on our maps all carefully labeled." He said, "I don't believe you." I said, "Well, it's still on the rack upstairs; go ahead and look at it."

So he tromped up there, and after about half an hour he came back and said, "Well, you're right." [laughter] I guess he could read a little Russian anyway.

Lage: The irony of the Cold War psychology.

Hedgpeth: Yes, I got so I--I should be ashamed of myself. I got in the habit of baiting these characters. We had a big affair with the Russian exploring vessel Vitiaz, meaning a knight, or a conqueror, very similar to Challenger, as a matter of fact, at least in the context of the name. That of course was the first big world-round research vessel in the history of oceanography. But the Russian ship was a reconditioned old fruit-boat, or something. Big ship, though.

Anyhow, they wanted to stop at San Francisco at Fisherman's Wharf. Since the request had come deviously from Canada via the Soviet Embassy in Canada to the U.S. Department of State in Washington, it became a high matter of protocol and all that. Since they had asked to come up by Dillon Beach where I had this lab then, I was a member of this discussion committee.

Things went like this: the navy wanted to pull them off to Treasure Island or down by the dock at Hunters Point where they could keep an eye on them. I said, "Well, they want to come to Fisherman's Wharf, and I thought we ought to be able to show

them this is a free country." They looked at me rather frostily. Some idiot said, "Well, they were talking about plannings all for the scientific staff, not for the crew. All these people play soccer, don't they?" And they said, "Yes, yes."

"Well, there must be a ship's crew for soccer. Why not have a game with them with the Olympic Club soccer team?" I said, "Well, it happens that this year's Olympic Club soccer team is a gang of Hungarian refugees who skipped the Australian Olympics. You'll have blood and brains scattered all over Kezar [Stadium] if you put that batch together."

Lage: They were Hungarian refugees?

Hedgpeth: I think they were Hungarian refugees. But anyway, the Olympics had been held in Australia. Somehow they wound up in San Francisco. So the committee agreed that might not be a very good idea.

When the dust was all settled, they all went up to Fort Ross and put their name in the book there--

Lage: They took the crew up there?

Hedgpeth: No, the party was supposed to be for the scientific staff. One of my friends who worked for the Office of Naval Research was along incognito; of course, it was difficult for him to manage that with me around. Some guy asked me if he could borrow the guest book from our station. I said, "What for?" He said, "We think some of these people were not supposed to have been on this trip." I said, "You think those guys would sign a guest book?" He said, "Well, you have a thought there." [laughter]

So after that, a few days later, the ship had gone, I got a call from ONI, the Office of Naval Intelligence, again, saying, "There's been a cylindrical package left for you here." I said, "It gurgles?" They said, "Yes. Can't send it through the mail, you know. When are you coming down to San Francisco?" I said, "I don't plan to come down for a couple of weeks or so."

About two days later, he shows up, said, "I just happened to be going by--"

Lage: By Dillon Beach? [laughs]

Hedgpeth: Well, yes, from Highway 101 out to Dillon Beach. Hardly what you'd call just dropping by. So he handed me this bottle all wrapped up, and I put it on the desk and said, "Thank you." He

said, "Will you open it, please?" I said, "Oh, all right." So I unwrapped it, and it had two brochures wrapped around it. He said, "What are those?" I flipped them open and said, "Well, this one's a guide to the great monastery over to the west of Moscow, sort of like one of our national park guides; here's the architecture and history of it, and not exactly what you'd call a military document." "No."

Lage: He couldn't read Russian?

Hedgpeth: I guess not. At least, he behaved as if he couldn't. And a reprint about a fish population, and the bottle was revealed at last. I said, "Would you like to photograph the label?" He said, "No, we--" and stopped in mid-sentence and realized he'd given it away. They'd been all the way through the thing, of course. He said, "Tell me, why did you stop there at the highway below Fort Ross? Everybody got out and broke off a piece of the redwood tree. Why do you suppose they did that?" I said, "Well, I suppose the commissioners advised them to bring back specimens to test for radioactive fallout." I should have been ashamed of myself, because he got real interested and started scribbling in his notebook. I don't know what the devil they made of that.

Lage: What was in the package, aside from these things that wrapped it up? Was it a bottle?

Hedgpeth: Yes, a bottle of second-rate champagne. Can't say that some of the Russian vintages are very good, but anyhow, just the thoughts behind them. [laughs]

Lage: Those are very telling experiences with the Office of Naval Intelligence.

Did the work on the treatise do a lot in terms of your recognition as a--?

Hedgpeth: Oh, yes. I was sent off to the Zoological Congress in '53 as an official delegate of the Geological Survey, and that sort of thing.

Lage: And you certainly got to know a lot of people that you--

Hedgpeth: Yes, and I got the nice invitations to the better cocktail parties and that kind of stuff.

Lage: Did you enjoy that?

Hedgpeth: Oh, sure.

Lage: At one point you make the remark that, "Not much was going on at Scripps in those years." Elaborate on that.

Hedgpeth: You see, they were just getting started. In the first place, what had been going on was highly classified, and this was the business of underwater sound and tidal heights and offshore--. They were working all this out, and they were strictly military matters.

There's a story about that, too; two of my friends in Washington were asked to do the same thing. They were under strict rules or regulations not to tell anybody what they were doing. It turned out they were trying to work out the wave action and tidal action on the atolls and so forth of the Pacific theater of war, and finally, inevitably, these two people wound up in front of some higher-up at the same time. One of them had been assigned to do this on the basis of Japanese maps, and the other on the basis of British Admiralty maps. "Why didn't you two guys get together? You've duplicated this work," and so on. "We weren't allowed to speak to each other, sir." [laughter]

So anyway, it was just beginning to open up, and it got much livelier as we went on.

Responsibilities of Editing the Treatise on Marine Ecology

Lage: Who was the director at Scripps at that time?

Hedgpeth: Roger Revelle.

Lage: How was it working with Roger Revelle? What kind of person--?

Hedgpeth: He never asked you to do anything. The only time he asked me to do anything is when he wanted to get in on the treatise; he thought maybe with this all going on, and seeing all these--

Lage: He'd been on the committee, after all.

Hedgpeth: Yes, right. I don't know how often he'd been to committee meetings. He was notorious for forgetting things. So he wanted to write the chapter along with the Australian fellow, named Rhodes Fairbridge. I don't think either of them understood what the other was trying to say. He was the last one to get his paper in, Revelle--this is to be expected--he often dabbled so long with the budget, or ignored it, he had to carry the entire

staff out of his own pocket for a month or so. At least one time, I worked on a monthly check from Roger Revelle. It was a no-interest loan, of course; we always paid him back, but it didn't endear him, I guess, to the pencil-pushers in the university system.

Lage: Was this just a habit of procrastinating?

Hedgpeth: Yes, I think so.

##

Lage: Now, you were mentioning Roger Revelle writing an article with somebody else, and they didn't understand each other. What did that involve for you as editor?

Hedgpeth: Well, I just had to ignore it, or correct their grammar when it got a little too fuzzy, which--.

Lage: Did you have to make major changes in people's articles?

Hedgpeth: Not then. I had to remove a lot from Hubert Caspers' draft; he wanted a whole subchapter on the commercial fisheries of the Black Sea, about another 100 pages. At that time, he didn't know English well enough to write it, so it was in German.

Lage: Did you have to translate it?

Hedgpeth: No, I prevailed upon Karl Patterson Schmitt at the Field Museum, who had a hobby of sitting around at lunchtime translating German for anybody who needed it. He would read and translate it off, and they would have to write it down as he proceeded. He learned his German from his German-speaking family in Wisconsin, I guess. German, of course, was a regular language in many of the high schools in the Midwest up to 1917. So anyway, old Karl would rattle these off. I think it was sent in bits and pieces anyway. He translated, and we assembled it for him. Finally, I realized we couldn't have that much on commercial fisheries. I heard a scream of anguish from poor old Hubert Caspers--"Aber, Gerade keine Kürzung, bitte!"

Lage: You'll have to translate that one--

Hedgpeth: "But certainly no cutting, please!" [laughter]

Lage: It's a delicate position to be in, I would think.

Hedgpeth: Yes, yes; you had to make some decisions now and then. Well, he took it in good grace. When he finally saw what we had done, he realized it was a bit out of place.

Lage: Now, I notice that you wrote a lot of the chapters. Had you intended to at the beginning?

Hedgpeth: No, I didn't know I was going to have to do that much. I knew I'd have to rewrite Gordon's, because his style was a bit more anecdotal than we needed. Also limited; he was restricted in some of the things we required, partly because of limited access to libraries. Of course, we supplemented it also with annotated bibliographies, and some of these are by different people.

Lage: How many volumes do we have here?

Hedgpeth: Two, the living and the dead.

Lage: So you have ecology and paleoecology.

Hedgpeth: Yes. I've got paleoecology, but I don't have much to say in that one.

Lage: Now, you say Gordon Gunter's style was anecdotal. Was that usual for a scientific presentation?

Hedgpeth: Not all of it, a trace of it. [in drawl] We are still friends, though I must say, his politics is something. For a while, he did time as a chaplain at a Jefferson Davis post of the Sons of Confederate Veterans. I asked "What do you do at those meetings?" "Well, talk about history and the past. I did accomplish something at the last meeting, there was some complaint about having the U.S. flag in the room alongside the Stars and Bars. I settled the argument by saying we could leave the U.S. flag out in the hall during our meetings."

We were driving along the waterfront past Jefferson Davis's mansion, Beauvoir, in Biloxi. He said, "We put one over on them Yankees. They don't know it, but the Confederate flagpole is six inches higher than the Yankee flagpole." I said, [in drawl] "You reckon I should take off my hat?" He said, "You're makin' fun of me." I said, "Well--." It cost me two bottles of bourbon to calm him. [laughter]

Lage: I hope he has a good sense of humor. It seems to me you'd need that to have the friendship.

Hedgpeth: Yes, yes.

Lage: This must have been quite an accomplishment, when the treatise finally came out.

Hedgpeth: Yes.

Lage: How did the fact that you were so involved in this publication influence your later direction?

Hedgpeth: Well, I learned a lot about all the worldwide situations and stuff.

Lage: It sounds like a great way to start out a career.

Hedgpeth: Yes. Gave me a lot of lecture material. [laughter]

Lage: And a lot of people got to know you.

Hedgpeth: Yes.

[I owe a great deal to Gordon because of our summer in the Sierra in 1938. He encouraged me to return to college, and eventually to work for the Ph.D. My thesis, in fact, is based on the work I did in the Gulf of Mexico as part of the job he got for me during the World War II years. Last December, when I had a speaking engagement in Tallahassee, I made a side trip to Ocean Springs to thank him for what he did for me. I don't know where I would have wound up if it hadn't been for him. It was probably our last meeting. --JWH, 3/2/1995]

Lage: Do you have anything to add about Roger Revelle, or what you saw at Scripps while you were there?

Hedgpeth: Yes. There were a lot of young people who were really coming up. Most of them have now finished their careers. For instance, [Henry W.] Menard, he died of cancer a few years ago. Several others have fallen by the wayside. But some of these people are the senior ones now, and, "Who are these new whippersnappers taking the place over, don't even know what oceanography is all about?" Well, they've had several directors who weren't oceanographers. Nierenberg was some kind of an atmospheric physicist or something, and he had an ego somewhat larger than necessary.

Roger was always pretty easy to get along with. They had a graduate student group that had no official name, really, that met around in people's homes, and after some experience with one professor who was a notorious windbag and would horn in on everything, the students decided that faculty members would be

allowed only by invitation. Since I was not on the faculty, I was more a member than visitor.

Well, Roger always tended to be overimpressed by slick-trick-talking fellows, so there was this guy, Buzzati-Traverso, an Italian geneticist who appeared on the scene, I believe, as a visiting professor at Berkeley for Curt Stern when he was on sabbatical. He came down to Scripps, and he gave us this song and dance that genetics is the only real biology because it was predictable. Some of the old guard around the place, like Martin Johnson, I don't know who else--oh yes, Denis Fox, who was the cause of the anti-faculty policy of the student groups and probably Carl Hubbs--resented Buzzati and did their best to "get rid of that damned Italian."

So anyway, one night, we were going to hear Buzzati defend his case. Roger asked to come along, so naturally they didn't tell him to stay away. You may have known, Roger Revelle was about six-feet-six or something. (One story about him is that the only shoe store that could outfit him was a store in Washington, D.C., that specializes in supplying shoes for outsized blacks. He said he and some other important personality were the only white customers of these people.) Anyhow, the conversation went on this evening in the usual agitated way, especially with John McGowan, who is now a senior biologist there I guess, simply by enduring it all. He's a little banty Irish type, expresses himself loudly and with somewhat picturesque profanity at times.

Anyway, after the evening, I was getting into my car, and Roger's car was parked right in front of mine. He turned back and looked and saw me, and he came over and said, "I'm worried about John McGowan. He doesn't believe in population dynamics." Well, in the context of that meeting, I didn't either. I said, "I don't either." Roger got up straight, shook his head, went on and got in his car and drove away. [laughs]

In his chapter he wrote for the treatise, he was the last person to submit his copy. And then about two weeks after, he writes me a little note on that inevitable blue memo paper that he would like to have his manuscript back so he could rewrite it, and he would of course pay for all printing costs and everything. Of course, I was only the--I was not the head editor of this series. That was Agnes Creagh, who was a very nice gal, but she was a pretty strong-minded Irish type herself. See, now her name doesn't even appear in it.

Lage: Doesn't appear. But she was editing the whole series?

Hedgpeth: Yes, she was editor for the Geological Society of America, and she had the last word over style and other such things. She did very well. But anyway, I forwarded this on, in fear and trembling. I got this letter which in effect said, "Roger can go to hell. The problem is not that somebody will pay for the cost, but all the time that's necessary to do this all over again!" So I went up and laid this in front of Revelle, and he looked at it. He said, "Well, she's right." [laughter]

Lage: A reasonable man.

Hedgpeth: He may have had some run-in with her previously, I wouldn't know.

Lage: He sounds like he knew it was hopeless. Was there any talk in those early years about expanding the campus to become a--?

Hedgpeth: Oh, yes. One of Roger's favorite ideas for a while was to call it a Technische Hochschule.

Lage: What does that translate to?

Hedgpeth: That would be the kind of thing like MIT or something, an institute. Of course, some of us wags, I don't know who did it, worked out an acronym for what we should consider the proper name for it: the Scripps Higher Institute of Technology. [laughter]

Lage: I guessed that before you even said it!

Hedgpeth: Yes, that didn't go so well. [laughter] So anyway, it became university. He irritated the board of regents no end, I gather, by preparing stationery on his own volition and labeling it as University of California at La Jolla, instead of at San Diego. Of course, the city fathers of San Diego rose off like skyrockets when they saw that one. [laughter] I guess he was reprimanded before the board for doing that, I don't know. It was sort of uncalled-for, like fiddling around in the budgets.

Lage: La Jolla is part of the city of San Diego, just for the record.

Hedgpeth: Oh, yes. Scripps Institution of Oceanography is still at La Jolla.

Lage: La Jolla maintains its own identity.

Hedgpeth: Yes, it's managed to hold out for its own post office and all of that. Well Roger was prone to that, but he was loyal to most of

his people. He and Carl Hubbs were on the same list for the National Academy--.

Lage: To be fellows?

Hedgpeth: Yes. I don't know which one was first, but I think Roger was. We were walking across the lawn that day, and I said, "I'm glad to see you've made the academy." He said, "Well, thank you, but I don't know what Hubbs did to deserve this." Of course, tried the same line on Carl Hubbs and got about the same kind of retort on Roger Revelle.

Lage: There wasn't too much love lost between them?

Hedgpeth: No love between those two.

Lage: I guess I don't know Carl Hubbs.

Hedgpeth: Well, Carl Hubbs was the big I am of ichthyology, had written hundreds if not thousands of papers. He couldn't say anything without having to put an "ah" between each word, almost. Took him a long time. The story goes he learned a bit of what we call Chicano Spanish by making trips up and down from San Diego to Ensenada, and probably further south of that, as a matter of fact. Anyway, he attempted to give a lecture in Mexico City at the big international geological convention, in Spanish. The audience awarded him both ears. [laughter] I don't think Hubbs ever knew what that really meant.

Lage: Well, what did it mean?

Hedgpeth: That's when you really bungle things in the bullfight, or anything like that.

Lage: What was the influence of this big red book itself on the field of marine biology? Did it take the field in a different direction or have an effect?

Hedgpeth: Not a particularly different direction, because we already knew those basic directions, which are in there. The only thing is, I pointed out it didn't have a chapter on statistical procedures. I couldn't get anybody who wanted to do it at that time. We had a person here who was doing a lot of nonparametric statistics. He didn't want to be involved. But for some years, the treatise was one of the essential books that had to be seen in every library.

The last few days of it I had to assemble the chapters and all that kind of routine stuff, so I had to spend about two

weeks at Columbia University in New York, in some little subsidized hotel they had for visiting faculty. What we had was a little attic suite somewhere in one of the buildings. I had to work right under the head of Nathaniel Southgate Shaler [founder of the Geological Society], which was bronze and looked pretty heavy, but it was fairly solid on its pedestal. They don't have very many earthquakes there, anyway.

Association with College of the Pacific

Hedgpeth: Our topic next time is going to be the Pacific Marine Station. How did you happen to move to Dillon Beach?

Hedgpeth: Well, Hubbs made me feel he wasn't too much interested in seeing me stay around La Jolla. I gather Martin Johnson felt somewhat the same way.

Lage: Did you get a sense of what their thinking was?

Hedgpeth: No, not really. Rather odd, as a matter of fact. I had been summer teaching at Dillon Beach for several years, since 1947, as a matter of fact, before I got associated with Scripps, as a summer instructor. So they [College of Pacific] made me an offer. They wanted me to come up there in the laboratory full-time. I had some certain sentimental attraction, I guess, to the place, since my father's people were all Methodists.

Lage: Was this the College of Pacific that was the overriding institution?

Hedgpeth: Yes.

Lage: And was that a Methodist--

Hedgpeth: Yes. You had to be a Methodist to be an executive officer in the place.

Lage: Did you have to be a Methodist to be a head of the laboratory?

Hedgpeth: No, they were a bit concerned about that aspect in me when they saw me smoking cigars, and they didn't approve of that. But anyhow, we got along all right in that context. They offered me the job, so I went up to see Roger and told him about it. He said, "Well, we've arranged a budget for you." See, I wasn't on the main line for anything in particular; I wasn't connected with any department or anything.

Lage: You weren't being paid by the departments. You were being paid by the Office of Naval Research.

Hedgpeth: Of course, two-thirds of the staff was on outside money. That didn't make much difference to me. But it didn't go through a regular department decision or anything. So I said I hadn't heard anything about that. He seemed a little surprised at that. I don't know who was supposed to have told me, but I expect it must have been Hubbs.

Anyhow, he summoned it up and showed it to me. I looked at it, and--see, they wanted me to run an invertebrate museum and work on the collections. They had a guy running the fish collections, which was Hubbs' influence, of course. The budget had already been debited before I even knew about it for about \$5,000 for office furniture and stuff.

Lage: You mean this was all set up, but no one had told you?

Hedgpeth: Yes, particularly Carl Hubbs. I took a look at that and I said, "Well, I think I'd prefer to go on and be cock of my own dung hill," or something like that--I don't know whether I said exactly that.

Lage: But you foresaw that this would be a difficult working situation.

Hedgpeth: Yes, it was obvious it would not be a very useful way to start out.¹

Lage: So the idea of being in charge of the lab at Dillon Beach was something that appealed to you?

Hedgpeth: Oh, yes. That, of course, was a little better country, too. San Diego is an awful, dry, desert place, and not much to do after you once go over the hill except look at an old ghost town or go out to the desert and wander around among the cactus.

Lage: Was La Jolla a lively place intellectually at the time, or was it kind of a backwater?

Hedgpeth: Oh, it was very lively intellectually, yes. We had all kinds of people there coming through, going on.

¹It is not without significance, and considerable speculation, that Hubbs left his files to the Scripps archives with the stipulation that they were to be closed for thirty years. --JWH.

Lage: We haven't talked about when you were married. We ought to get that date on the record at this point.

Hedgpeth: Florence and I were married December 29, 1946, in Texas. [We have two children: Sarah Ellen (Mrs. Paul Boly), vice-principal of Westview High School in Beaverton, Oregon, and Warren Joel, a practicing architect in Santa Rosa. Both are graduates of the University of Oregon. Sarah has two children and Warren, four. Since Sarah's husband is a grade school principal, both the children get all A's; they have no choice--JWH.]

Lage: Did you meet your wife in Texas?

Hedgpeth: No, at the Ferry Building in San Francisco, after some correspondence. Later she came down to Texas. We're both graduates of the same class, but you know how Berkeley is. It's even bigger now.

More on Graduate Studies in Texas

Hedgpeth: Anyhow, in Texas I was registered as a graduate student. I had to get out of the Game, Fish, and Oyster Commission, because there was a very peculiar boss who was somewhat difficult to get along with. Turned out later he had done time for petty thievery or something, but I never detected any of that aspect in his conduct. He was an essentially untrained person who had a heck of a lot of energy, really could work hard. He loved to drive around in the fast Texas patrol boat. It's rather dangerous in those shallow bays, because there was apt to be a log or something floating around to run into. I gave him the name Admiral Bilgewater behind his back, and finally--it may have got to him, I don't know.

So the University of Texas was building this lab at Port Aransas, out on the outer shore of Mustang Island, and Dr. E. J. Lund came around to Rockport and he said, "We have to have somebody there before we can open the place for any regular work to meet the fire insurance requirements." He was talking to me about Thursday or Friday, and "Would you move over there on Monday?" [laughter] I did. I went to Port Aransas and registered with the University of Texas as a full candidate for the doctorate.

Lage: And you were heading up this lab at the same time? Overlooking it?

Hedgpeth: Yes. I was sort of the chief biologist at that time. Gordon Gunter was director for a while, except he was over in Miami as visiting professor for a year, teaching at the time. Anyhow, Dr. Lund was a person who had a high capacity, being a stubborn Swede, for irritating people. I don't know what brought it all on, but he was tried before the faculty senate for refusing to teach a course. The course was biophysics. He was a great one on studying electric patterns in fir tree tips and this kind of stuff. He wrote a whole book about it, as a matter of fact.

Anyhow, I was up there in Austin one day when this fight was in full tilt. He wasn't around. I was in his office, it was a warm day, a long drive from the coast up to Austin, 200 miles. So I was reclining on the couch in his office and the people came in and didn't see me. They were from the botany department. Lund had a greenhouse there, raising a lot of plants. They had charts, and they said, "Now, we will turn this into such-and-such a room, and we will put in a partition here," and this kind of conversation. Of course, I knew that Lund had never heard about these characters, guys from the botany department anyway.

As the fight went on he would come down from Austin and would sit there and read the testimony of his trial and complain flat-out, "Can't you see how wrong this is?" Well, I understood enough English to know he was misinterpreting some of the stuff.

Lage: So he was at some--

Hedgpeth: Well, they said what he had done was--he said he couldn't find any physicists who wanted to take his course who knew enough biology, and he couldn't find enough biologists who knew enough physics or mathematics to take his course, so he canceled it. Nobody met the prerequisites. Well, this was considered a disingenuous way to look at it.

Lage: Terrible lot of back-biting going on.

Hedgpeth: Yes. It went on for years.

Lage: Well, it brought you back to California at least. We might have lost you.

Hedgpeth: Dr. Lund was a member of the American Society of Zoologists, and one of the things he was charged with was abusing his mailing privilege by sending out an eighty-page statement of his cause on the university mailing privilege to the entire membership of the American Society of Zoologists. [laughter] So I wrote back to the chairman of zoology at Berkeley at the time, who was

Harold Kirby, and I said, "I have encountered some difficulties here, perhaps best explained if you've seen Dr. Lund's statement he sent to the ASZ membership." The reply from Kirby was very brief and to the point: "We certainly have read that statement. We are arranging for a fellow teaching assistantship for you for next term." That was that.

Lage: So you got some sympathy there.

Hedgpeth: Well, it was obvious there was going to be a fight. One of the things Lund did was go out and make a lot of money in real estate. His wife said, "You're supposed to be bright; you ought to be able to make more money than all those fool professors over there."

##

Hedgpeth: So he invested in real estate and subdivided one of the choicest parts in Austin.

Lage: Did that annoy people, or did it--?

Hedgpeth: It annoyed his faculty colleagues. He obviously was becoming a millionaire. That just didn't ride well with some of these guys. But anyhow, the controversy was all through no fault of my own. I did go as far as two foreign language examinations. Of course, they were not allowed at Berkeley, but it didn't matter.

Lage: What do you mean, they weren't allowed at Berkeley? Oh, they didn't accept them?

Hedgpeth: Yes, they don't accept a foreign language exam because they want it given by faculty members who can--most institutions are this way--see whether you know enough science as well as the language to manage with it.

Lage: They want their own professors to give the exam.

Hedgpeth: Yes. I remember the one in French I took at Austin was kind of funny. You were allowed to bring along your own book, so I grabbed the first thing off the shelf, a little book on oysters, and oyster culture. The gal who was assigned to this language exam was from the French department at Austin. She asked me to translate this paragraph as I read it, and so I did that, and that was all right. Then some chum of hers came in, just from Paris, and these two ladies got to jabbering away in machine-gun French. Finally she turns around to me and says, "Can you explain why we don't have any good oysters in Texas?" in

English. So I got to talking about the Texas oyster problems, and "Eh bien, that's beautiful."

Lage: You explained it in French?

Hedgpeth: No, I did not. You don't have to speak the language to pass a reading exam, you know. She was too interested in the latest notes from Paris from her friend. So finally she more or less pushed me out of the room, signed my card.

The other guy in German collected dictionaries, and I said, "The problem I have here, sir, is that you have so darn many dictionaries, I got too interested in looking at the different definitions of some of these long words." "Mmm, yes, I suppose that's right," and then he signed me off.

When I got to Berkeley I got through the exams very easily. The first part of the German exam was very easy; there happened to be a lot of pictures in the paper the professor had assigned me to read, and you can translate the pictures and come out pretty well. The second was a couple of long passages from Richard Goldschmidt's *Physiological Genetics* or something. He said, "The first part of your exam is pretty good, but this second part, I don't know."

I said, "Dr. Stern, I have enough trouble trying to understand Professor Goldschmidt in English." He said, "Jawohl!" and signed the chit. [laughing]

Lage: It helps to have the quick comeback, I would think.

Hedgpeth: Yes, I guess so. So that was that.

Then the other one was funny, that was French from Goldschmidt himself. I knew French a little better than German, but anyhow, got a long chapter on stridulating organs in orthoptera, which means grasshoppers and crickets. At the end of it, I wrote a list of names. I said, "These apparently are local names for various kinds of crickets." He said, "Yes, they are. Nobody knows things like that in another's language, you know." So that was that.

Lage: That was okay?

Hedgpeth: That was all the comment I got from him.

Lage: At least you knew what they were.

Hedgpeth: Yes, that's the main thing. Yes, they won't fight too much when you indicate that.

Lage: Okay, well I think we should stop for today and take up next time with Dillon Beach, and I'd like to talk about the Bodega Head controversy--

Hedgpeth: Oh, yes, that!

Lage: --and the way you brought that to light, and some of your observations on the PG&E and on the fight against PG&E.

Hedgpeth: Aha, dear me, yes.

Lage: That should be lively, shouldn't it?

Hedgpeth: Yes. Yes, that was kind of entertaining in some ways. Did keep me occupied.

V DILLON BEACH AND BODEGA BAY, 1957-1965

[Session 5: October 15, 1992] ##

Director of the Pacific Marine Station at Dillon Beach

Alden Noble

Lage: We ended last time with your story of how you happened to leave Scripps and come to the Pacific Marine Station. So I wanted you to give me an idea of what the Marine Station was like, and something about its background, and then we'll go from there.

Hedgpeth: It goes back, in part, to the influence of Drs. Light, Kofoid, and those people in the grand old days. Alden Noble was a student there in the 1920s.

Lage: What was that name?

Hedgpeth: Alden, direct descendant of John Alden. At any rate, he got a degree in working in parasitology primarily. Both he and his two twin brothers did. As far as I know, the twins are still living. One is Glenn, who was the professor--Glenn was at Cal Poly, and Elmer was at UC Santa Barbara. Elmer rose to the position of assistant or maybe chancellor for a few years. He was a fairly well known administrator. But they were born in Korea, and all of them spoke Korean, I think. Their parents were Methodist missionaries.

When they came over here, the Korean accent sounds very much like a British accent. Alden was, I think, the oldest member of the family, in his generation, anyway. He started leading field trips in zoology out to the nearest beach. He was at the College of the Pacific then.

Lage: He was a marine biologist?

Hedgpeth: Yes. Well, he was by more or less general background. So he liked to run summer sessions, and for a while, they used to rent the old dance hall at Dillon Beach. The University of California was interested in getting a marine lab somewhere near Berkeley. For years, they went down to Moss Beach.

But anyhow, both universities were trying to get out to the seashore, and at Berkeley, they used to give Easter courses, a week course, and that was held at Moss Beach. The only building big enough was the local beer hall, and Dr. Light used to have to lecture at the bar, standing over the bar.

Lage: [laughs] From his pictures, it would seem that would be very incongruous.

Hedgpeth: Well, he managed to get along with these minor indignities, you know. Took that in his stride, though I'm not sure he hasn't made jokes about it.

So both Berkeley and Pacific were interested, and there was some talk for a while that they might join forces and have a cooperative lab at Dillon Beach. I first saw the beach in 1941, and that was in the spring or early summer, when the tides are very low. Light was running that course at the time, and I think Ed Ricketts stopped by to give a lecture also.

Lage: You were a student?

Hedgpeth: I wasn't a student there at all; I had been a student of Light's, and had been on the regular field trips to Moss Beach two or three times. One of his characteristics was to get people to see as much of animals in nature as possible, and he picked this seashore for that purpose. So Light and Noble got along pretty well, but I think there was always the basic worry that big brother would be a bit overwhelming.

So then the war intervened--see, the summer of '41 was the last session of anything for several years around that part of the coast. Soon after December 7, the army moved in and fortified Tomales Point. I don't know if they had there more than 50-caliber machine guns or something. I just learned the other day a funny thing I didn't know about, that a Japanese submarine stopped two or three times at Port Orford, Oregon, and they submerged and rested on the bottom near Battle Rock. My great-grandfather founded that town.

Lage: And they knew--they tracked them at the time?

Hedgpeth: They didn't know about that. They didn't know it until after the commander of the submarine let it all out years later. See, they had dropped some of these--thrown a few shells over, and set loose some balloons, fire balloons. Fortunately, they didn't start anything. You have to have the right climate and wind conditions to really do damage with those things.

Anyhow, Dillon Beach was closed, pretty much off limits except for people who owned cottages there and came out for a couple of weeks or two. But they couldn't have classes there or any of that kind of activity.

Charles Berolzheimer's Contribution

Hedgpeth: So as soon as the war ended, about '45, '46, the interest renewed. Noble had given a course of field trips at one time or another which Charles Berolzheimer attended. He was a member of a very wealthy family, the owners of Little Saint Simon Island in Georgia, and the Great Simon Island used to be owned by the Baruchs, I think. As far as I know, Charles and the family still own Little Saint Simon's, and they welcome people to come there and look at the birds, Audubon types and so on, so forth. He said any time I get anywhere near reasonable distance of the islands, say like Atlanta, I was to phone the number and they'd send a plane to take me out there. Well, I have never been near there since. I'd like to see their island, but I don't know whether I ever will.

He was very curious and a person interested in all sorts of things. So the family gave him one of their businesses, one of these kind of things they didn't realize they had or anything, namely a mill or a plant in Stockton for sawing up pencil slats. It also included a lot of forest land. Now, the best tree for this is the incense cedar. The place is called California Cedar Products. You have to understand the significance of this in another way, namely that most of the lead pencils we have, the leads are made in Europe, Czechoslovakia in particular.

Lage: This was even back in the forties?

Hedgpeth: Well, of course, now, lead pencils are an endangered species, but Berolzheimer hopes not, obviously--. So to make the wood casings--a lot of those pencils are cased in this country--they have to cut them in blocks about six by three inches, and I don't know how long--and then they have a gang saw which saws it up and it splits up into slats. Then they work them in other

processes into those little halves that they encase the pencil in. So who controls the cedar controls a lot of the wood pencil market in the country. I called him the pencil baron now and then. [laughs]

Lage: And he controlled the cedar, is that what we're--?

Hedgpeth: Yes. He donated the cedar for the buildings, they were made of incense cedar.

Lage: The buildings at Dillon Beach?

Hedgpeth: Yes. The framework of the buildings, two big buildings, were government warehouse steel framework, and these planks are three inches thick, because they had the dry rot in them. Most of the cedar when it gets older, apparently, very commonly, has dry rot, and when you get a three-inch plank, there's seldom a place where the thickness is less than an inch. So these are heavy, stout things, and they simply bolted those things to the steel framework.

Now, a story about that, of course, goes all the way down to the end of time. County regulations say that studding must be used so many inches apart, fourteen inches, and all of this kind of stuff. They came out and looked and saw this was impossible. Of course, they demanded all electrical connections be in conduits. It cost much more to do that than string them up if anything. We had our problems with the Marin County Building Department, or whatever it was.

I remember once when we were changing some wiring, I phoned down and said, "I think the electric wiring is now ready for inspection." The little girl said, "Well, Mr. Faraday will be right out." I said, "Mr. who?" She didn't think that was odd at all. [laughter]

So when the Marine Station was abandoned, Pacific found itself in a real hole. You've got a building that's not to standard specifications, which was more or less conceded to the university for this particular function. When one guy on the county board expressed fear that that dry rot would infect the buildings nearby, Berolzheimer hired several wood specialists to point out this stuff is not transferrable from one piece of lumber to another. He hired a whole committee, I guess.

Lage: Was this when the station was closed in the seventies?

Hedgpeth: No, it was when it was being built. And he was donating all that lumber for it; it came from him. For years, he subvented

the lab by about \$5,000 a year. I never knew about it, I was never told.

Lage: Did he come around?

Hedgpeth: Yes, he often came around. He was a great one for picking up interesting characters. I think they picked him up, to some extent, minor French nobility and heavens knows what. Of course, he paid all their expenses, so he'd always be bringing in these interesting and sometimes strange people.

Lage: But you didn't know that he was donating on an ongoing basis?

Hedgpeth: I was not told by the business office.

Lage: Isn't that interesting?

Hedgpeth: Yes. And I've never told Charles that either.

Lage: What made him become interested in the lab?

Hedgpeth: He was interested in Alden Noble, because he had taken the course in marine life. He had a very lively interest in that kind of thing. So this was primarily based on the fact that Alden Noble was being helped out.

Lage: Now, Alden Noble was still around when you went--?

Hedgpeth: Yes. Actually, I started going to Dillon Beach about 1946 or '47. I was down in Texas at the time, and wrote a letter saying I was interested--

Mrs. H.: It was the summer of '48, Joel.

Hedgpeth: Well, you think that was it? Seems to me I was there one time before. But anyhow, yes, they dedicated it in '48. I know they had a session in '47. So I became a member of the summer faculty, came there for several years.

Classes and Oceanographic Studies at the Station

Lage: Would you be teaching to the college students, or the broader community?

Hedgpeth: No, what we did for the community is hold these public lectures. That was my idea. I was surprised at the number of people who

showed up. Of course, Dillon Beach is not exactly on the main line, you know. A lot of these people came from San Francisco or Oakland. Of course, what they did was--we'd usually give it on Fridays or sometimes Saturdays--they'd go and load up in the Italian restaurants in Occidental and then come back in a mildly torpid state to listen to lectures. That was all right by us, but anyhow, that was the routine, you see, coming up that way. I don't know whether the restaurants are as good as they used to be or not. Some of them used to be very fine.

So we arranged series on every conceivable subject related to the ocean or the locality. Most of the lecturers were my friends from UC Berkeley.

Lage: Was this during those summers, or was this after you became director?

Hedgpeth: It was after I became director. Put in a little budget for that, not very much. [We paid the speakers fifty dollars, and some of them spent overnight in the dorms. Some who brought their wives spent the night at our homes. Our most popular event was the seaweed excursion, led by Professor [George] Papenfuss. He arrived early in the morning for the low tide and stayed with people well into the afternoon, helping out with identification of the specimens. He loved it. --JWH]

Lage: Was it a project that broke even, or did it have to be subsidized?

Hedgpeth: Well, they were free.

Lage: Oh, all the better.

Hedgpeth: Yes, we didn't expect to make any money out of that.

Lage: Times have changed.

Hedgpeth: I know. Yes, things ain't what they used to be.

Especially toward the end, we were operating primarily as a graduate department of Pacific. We granted the master's degree, and Pacific really didn't have the faculty for a good doctoral program, though they changed their name to University of the Pacific, gave honorary degrees, doctor of this or that. I remember them giving my distant cousin Herschel H. an honorary D.D., and as I passed by the academic line-up in the hallway, waiting for the procession, I heard Herschel say, "Where's my renegade cousin?" They looked over at me, "Oh, there you are." I said, "Well, I congratulate you, sir." Well, the president

and the vice president were standing around beaming. Herschel said, "Well, you know, D.D. either stands for deserved dignity or donated dignity." [laughter]

Lage: Sounds like something of a renegade himself.

Hedgpeth: They were usually given to help the person, or he'd just been named district superintendent and it was always felt the district superintendent, you know, sort of like a monsignor in the Catholic hierarchy, ought to have some title that might enable him to get a little more money out of the congregation. Methodists work that way. But I must say, it was highly amusing. Made up for the fact that we all had been ordered to buy academic regalia, and we were always seated in the rooting section of the stadium without any protection from the splinters. It was where the students sat, they'd had heavy paper put on the seats so they wouldn't harm the robes, because they all had rented robes. I always thought that was not very nice.

Lage: And you sat in your own robes--?

Hedgpeth: Yes, in the splintered seats. Discrimination in sort of reverse.

Lage: So your program was an academic program as well as a public program?

Hedgpeth: Primarily academic. The public thing was only in the summer season.

Lage: Was that part of your responsibility too, the teaching of these students, or were you more running the lab?

Hedgpeth: We were funded enough to bring in visiting instructors, too, so they could offer courses like oceanography and ichthyology. That was one of the years of white shark occurrences, and everybody was chasing white sharks around. Our ichthyology prof was the only one who didn't catch a white shark, poor fellow. He's retired out in--that horribly expensive region over there, what the heck is that thing called, right below the Gualala River in northern Sonoma County?

Lage: Sea Ranch?

Hedgpeth: Yes, he lives in Sea Ranch. His father-in-law was a very successful engineer. He helped design our seawater system. We had a seawater system, couldn't figure out why we weren't pulling much water in. See, we had to get out to the sandy

beach and use a filter out there. One of the disadvantages of Dillon Beach is that the exact locality is inside a sandy beach, so we had to filter water through the sand and pump it up about a quarter-mile. That was the difference between about a half-inch pipe and three-quarter-inch pipe. Mr. Mercer, or whatever his name, sat down there with his pencil and said, "Well, to begin with, you need a slightly larger pipe," in working on the five-fourths or something like that ratio, circumference and volume and so on. Well, it was an arcane world to me.

But what he did for us, I suppose it would cost us several thousand bucks with anybody else, he did it all just for fun. He was designing pumping systems for Arabia and that kind of stuff, so I--

Lage: So he was a good resource.

Hedgpeth: I think he was a good resource for Fred Tarp to settle down in Sea Ranch. We bump into him once in a while in the store in town, and that's about it.

Lage: Why were you pumping the seawater in? Did you have tanks?

Hedgpeth: We had aquariums. We wanted to work with living materials. So we had water tables, and an aquarium. The idea is, you bring your animals in as alive as possible and watch them for a day or two. A lot of students got interested in things that way, and kept up with it. One of our prizes was--of course, she didn't seem like that at the time. She was pretty much a kid then, I think barely out of high school. Something seems to infest young ladies with the idea that nudibranch are such beautiful animals, we ought to be able to preserve them in full color. Well, this is biochemically impossible. There's no known way to do this. Try to tell them that, and they still want to fiddle around with that.

Anyway, this gal was pretty bright, but the course she was taking was a bit over her head. Lo and behold, about three years ago, she gets a \$25,000 prize for junior high school teaching. I had lost track of her.

Lage: Do you remember her name?

Hedgpeth: Yes, Joan Steinberg. And so I phoned her up to congratulate her, and she said the best course she ever had was the one we had out at Dillon Beach. That was a wild one, because that was the year of '51 when we had a lot of very advanced doctoral candidates from Berkeley. They didn't want to take the course from Ralph Smith and Cadet Hand.

Lage: Why is that?

Hedgpeth: I think it in part was the ancient dichotomy that existed between paleontology and the vertebrate museum. The museum was Dr. [Joseph] Grinnell's bailiwick.

Lage: The Museum of Vertebrate Zoology?

Hedgpeth: Yes. And these people thought and lived rather differently than the people up on the fourth floor. Field work was emphasized under Grinnell. Bird watching was his forte.

Lage: What were the differences?

Hedgpeth: First place, their leading professors loathed each other.

Lage: Personally?

Hedgpeth: Yes, and they wrote rather stiff little memos on interdepartmental or intradepartmental blue stationery. They refused to speak at times, apparently.

Lage: This was paleontology and the museum?

Hedgpeth: Paleontology and the museum, they got along all right. But the invertebrate or general zoology folk up on the fourth floor were the hitch, and they were the ones that ran the course.¹

Lage: And that was Cadet Hand and--?

Hedgpeth: Ralph Smith. Well, Ralph was an interesting character. Sir Maurice Yonge, a visiting professor from England, said once he was spending all his time trying to live up to the expectations of that austere New England intelligence, referring to Ralph Smith. I think I used that when I was asked to roast him at his retirement party. I did tell some of the stories about him. There was one about the hotshot solid A student who, when he got a B in the course that Smith gave--he gave a course that started on Friday afternoon and lasted until Monday morning, because it was a course in physiology and he asked you to do experiments, some of them requiring twenty-four hours or that kind of stuff--this guy got a B in the course so he went around to see Ralph. He said, "What's the matter? What did I do to deserve a B?"

¹Since that time old L.S.B. [Life Sciences Building] has been completely rebuilt inside, with entrances placed in the middle--a whole new world, and everybody reorganized and most of them in "Integrated Biology."
--JWH.

Ralph said, "Well, you know, I didn't see you around on Sundays. I didn't think you were interested in the course." [laughter]

There was another one played on him at a Christmas party skit by a fellow who's now up in Oregon, Frank Gwilliam. Ralph had this habit of tucking his necktie in his shirt all the time, so at his roast we all arrived with our neckties tucked in the shirt.

So anyway, the story is that Professor Bligh was out on a field trip with his class. The teaching assistant runs up and says, "Professor Bligh, the waves have just carried away two of our students. What are we going to do?" He said, "Send out the reinforcements." [laughter] These were the kind of stories that generated about him.

The Paleo Department asked me if I would serve for the living invertebrates on their prelims, and I said, "Well, I know what's going on, and I'm not out to drum up trade, but I would prefer to examine students who had taken a summer course so I'd know something about them." So that year the course was packed with invertebrate characters and paleontologists, and poor little Miss Steinberg was sort of lost in it all, but she did pretty well. I gave her a B.

Lage: So they were there because you were going to appear on their doctoral panels?

Hedgpeth: Yes. Oh, I had great fun with that.

Lage: How did the conflict between these two departments come into play here?

Hedgpeth: I don't know if it was so much of a conflict--.

Lage: Did you get in the middle of it?

Hedgpeth: No, I took a seminar in paleo from Wyatt Durham; I don't know how I got mixed up in it. But of course, paleo was clear up in the Hearst Mining Building with geology, and geographically it was far away from LSB and even from the library.

Lage: That's an odd placement for it.

Hedgpeth: Yes. Well, they had their own library up there. But they sort of lived in their own world. That's one of the reasons the Treatise on Marine Ecology was made at all, was to try to bring

a living life to the people who were interested in animals that were very dead. Things have changed in that a bit, I think.

Lage: In what respect?

Hedgpeth: Well, they're more enlightened. Actually, you see, Dillon Beach plugged along as a sort of an insular little place, not too well known, until Ralph Gordon Johnson appeared on the scene.

Lage: When was that, and who was that?

Hedgpeth: Actually, I have an obit here on him that I keep [by Thomas J. Schopf, from *Paleobiology*, Vol. 2, No. 4, Fall 1976, pp. 399-391]. Ralph died in 1976 at forty-nine.

National Science Foundation Program for Teachers

Lage: When did Ralph Johnson come to Dillon Beach?

Hedgpeth: Oh, around 1957, just when I got up there as full-time director. Pacific wanted me to come up there; at least Noble did. So I remember there was this summer group, a field trip group, coming out there, and the high school instructor got to talking to me and he said--

##

Hedgpeth: --"You know, we've been asked to bring these field trips out to the coast. But we have no background for this. We don't know anything about all of this."

Lage: And this was an instructor from College of Pacific?

Hedgpeth: No, this was a high school teacher of biology. So that gave me an idea, and at that time the National Science Foundation was sending out a circular about its research participation program for high school-junior college teachers. So I sent in a proposal, got accepted, and it must have been right after Ralph had arrived. He came out from the University of Chicago, according to a letter he wrote here. He was trying to study the recent environment to get clues for the past. One of the reasons for doing this at Tomales Bay is that at Millerton Point--I don't know how well you know the geography around there, right opposite Inverness--

Lage: Millerton Point, it's called?

Hedgpeth: Yes. There's a fossil deposit of Pleistocene age or late late Pleistocene, early Recent, or whatever, some of the same species, but there are others in there that indicated that the water was warmer then. He was comparing that to the present living associations. Then for years, he worked in a critical study of the reality of communities and this sort of thing. It's not very well quoted in most of the literature at the present date. I think it was published mostly in paleontological journals, but it's actually for present times as well. So he worked on that for several years.

Lage: Was he centered at the Dillon Beach Station?

Hedgpeth: Well, he came to Dillon Beach, and then I said I would recruit a team for him. He said, "Really?" Very skeptical about it at first, it turned out to work well, and they really enjoyed the experience.

Lage: This was the high school teachers?

Hedgpeth: Yes. And junior college teachers. One of them became the president of Skyline College.

Lage: That must have been exciting for them, to be a part of a research program.

Hedgpeth: Yes. Another was David Mertes, who's now chancellor of the entire junior college system in the state. He was responsible for my getting a secondary teacher's credential, though I have never had a course in education. But just after I retired, I came down here looking for something to do, to get back in line. I talked to Mertes; he was at that time president of San Mateo College. So we cooked up an evening lecture series about San Francisco Bay that included a field trip that started with buses from Coyote Point at San Mateo and went over to the Coyote Hills on the other side of the bay where they have that big Indian midden and museum.

Then we went on up to Stockton and took a boat down through the delta, with Karl Kortum telling us whatever old hulk in the mud along the way was once some great ship--he knew the names of all of them, and that sort of stuff--and down the bay to Coyote Point. We had a lot of fun with that. But anyhow, in order to give credit, I had to have a credential. I didn't have a credential. Dave said, "Well, you can apply for a temporary credential," so I did that. Cost fifteen bucks. I got a snippy letter saying, "We note you have had no courses in education, and you have no courses in the subjects you are teaching. Therefore, we don't think you're entitled to a credential."

So I said, "Dave, you know, I'm thinking of writing a letter to these characters pointing out if they're going to talk like that, they ought to revoke the credentials for any student who's claimed credit for taking my courses." He said, "Oh, don't do that, I'll do something." The next thing I get is--they hadn't returned my fifteen bucks, either--a full-time, lifetime credential. I've never invoked it; I ought to frame it.

Lage: I think you should! [laughter]

Hedgpeth: Harder to get than some of the other things I've gotten.

[However, I was elected a foreign member of the Linnean Society of London a couple of years later, framed their handsome certificate of membership and hung it on the wall. I get announcements of all sorts of meetings I cannot attend. --JWH]

Anyway, Ralph Johnson came in the program, and he really took over. This was carried on in addition to the regular students.

Lage: This was a separate program of teaching how research is done.

Hedgpeth: Yes. We got funded for that pretty well. We got enough for Ralph to come out in the summers and all that sort of thing.

Lage: Was he still based in Chicago?

Hedgpeth: Yes. So this was a University of Chicago connection, and some of our students went back there. I think that the most interesting one that appeared was--somehow, Ralph had been asked by this boy's parents whether he would help them out. Well, they were Polish anthropologists and--most Poles seem to be anthropologists--

Lage: [laughs] I hadn't heard that before.

Hedgpeth: Yes. And Steve had been in one of these high-pressure special science high schools in New York City. When he came out, he was a pretty good boy. He eventually got his Ph.D. at Chicago. He's now living in Petaluma, doing part-time teaching for San Francisco State. They have for some reason, been required by politics or something, to have a course in oceanography. He'd been giving it at Tiburon for some time, and now it's also taught on the main campus. Some students can't afford to drive out to Tiburon and back. Ghastly place to get in and out of, you know, way out the end of the peninsula, at that old navy net depot. It had a terrific dock, and great, big wartime storage-

building-type structures where the staff rattled around like a few dried peas.

But anyhow, so he was one of Chicago's prizes. But there were several people working through Ralph in pretty high places now. Ralph had quite a collection of students at one time or another, and then he got liver cancer and that took him down in about two months. He was succeeded by Tom Schopf.

Lage: Now Schopf is--?

Hedgpeth: Dead, too. I think the stress of trying to keep up with his brothers did him in.

Lage: He's the one who wrote this obituary and--

Hedgpeth: He died. Yes, he died on a field trip in Port Aransas, Texas.

Lage: Did he have any connection with Dillon Beach?

Hedgpeth: Not really, but he was chairman succeeding Ralph.

Lage: Chairman of the department in Chicago?

Hedgpeth: Yes, the Department of Geophysical Sciences, an unlikely sounding category that included people actively involved in "neo-ecology," and included paleontologists, geophysicists, and other such people.

Other Studies and Researchers in Tomales Bay

Lage: What else was there about the physical setting at Dillon Beach that pertained to the Marine Station? You mentioned the fossil bed and--

Hedgpeth: Yes. Well, there was Tomales Bay, and we had a small boat and we could go out--kind of small, about a thirty-seven-foot boat, surplus--in fact, they even wanted to give us a submarine over at Mare Island when we went over there to see if they had a better boat. Of course, we were an educational institution, and right after the war, they were going to give you everything. But the controlling depth in and out of Tomales Bay is nine feet. Just what we could do with a submarine in there; if we ever got it in, we'd never get it out again. [laughter]

Lage: That might have been fun, though, for some other exploration.

Hedgpeth: Yes. But even floating above water, a submarine takes more than nine feet.

Lage: Was a lot of your work done in Tomales Bay?

Hedgpeth: Yes. Done over on the other side of Tomales Bay, in the sea side, still inland. White Gulch is a little cove which is a very fine place for field studies. Of course, the process of field studies has changed through time. These communities are mostly scattered around mud flats and sand flats.

Lage: Any other visiting professors we should talk about? Was this cossack Victor Loosanoff a visiting professor?

Hedgpeth: Cossack and adjunct professor--well, a research worker who came toward the end of the life of the station.

Lage: Did he come after your time there?

Hedgpeth: I knew him personally; toward the end of his career he worked at the Tiburon laboratory. But, he was at Dillon Beach most of the time when I was in Oregon. He was working on oysters, and he needed the seawater. The water in northern San Francisco Bay gets too fresh at times for oysters, or did then, I don't know what it is now. But in winter, of course, there's sometimes a pretty good run near the surface. Anyway, he was conducting experiments in oyster culture. He worked out a system of culturing the organisms that oysters eat. For a long time, this was not known, just what--how to feed them. So what you did was mostly put them around in bays where you thought they'd do well after you hatched them out. The system now used in most shellfish laboratories was worked out by Loosanoff.

Lage: What did your own research focus on during this time?

Hedgpeth: I was working on my own little animals, the pycnogonids, writing papers every once in a while. And some of the community work rubbed off on me; I did some of that. That was great fun; it was a nice little place to work with.

Lage: Where did you live during that period?

Hedgpeth: First fraction of the year, we lived on the beach itself. Then we moved in to Sebastopol, lived there about seven years, I guess.

Lage: How did the relationship with the College of Pacific work out? Did they hang over your shoulder a lot, or were you pretty much left on your own?

Hedgpeth: I worked directly through the vice president or whatever he's called now.

Lage: What was his name?

Hedgpeth: His name is Samuel Meyers, Sam Meyers. He was a marine biologist, but he always wanted to be president of a college and finally he was offered the presidency at Alma College somewhere in Michigan. And whether he's still there or still living, I haven't heard from him for years. But he was all right, he was pretty good to get along with. I worked directly through him on course requirements or anything else.

Lage: Did the courses you offered have to go through approval processes and all of that?

Hedgpeth: Not really. Come to think of it, we just set them up in the summer catalogue and sent it over to be printed. I think we were more or less trusted to offer pretty standard stuff.

Lage: What about Alden Noble? Did he continue to be involved?

Hedgpeth: Not much. He was pulling out after a couple of years. I think he was getting pretty tired, and all of a sudden he just had a bad heart attack and died.

Lage: Anything else that we should get a handle on about Dillon Beach before we go on to talk about the proposed nuclear power plant at Bodega Bay?

Hedgpeth: They're kind of mixed up.

Lage: Did they get mixed up?

Hedgpeth: Well, no. You see, part of the reason for opposing the power plant was that we were conducting long-term studies on the tide flats for many years, and their possible changes in the environment, and if you produce perturbation like that in the system, well, it's apt to produce results that you can't evaluate properly.

Lage: Were you researching up in the Bodega Bay area, or did--?

Hedgpeth: No, but we were--

Lage: You just knew it would affect it.

Hedgpeth: We were right downstream, we knew it would affect us. One of our people, as a matter of fact, when the quarrel really got

going, got his masters working up drift-bottle results and things.

Lage: To see how the tides and whatnot would--?

Hedgpeth: Actually, he released batches of bottles right at the proposed power plant site, and threw them out in the ocean. Of course, some of them came right back and smashed against the rocks. But others went on their way. Some of them went all the way down to Inverness and all, right past the middle of Tomales Bay. Once they got caught in an incoming tide, they got pushed right down. Then there were some that disappeared. See, we had these orange tags you put in a small half-bottle size, and ballasted them with sand, so that just the top came above the water. The idea was that you couldn't put them down too far, because then you would have something you don't know about, but enough so that the main surface currents were catching them, and there isn't enough up above water to take the wind. All this has been gone through for years with drift bottles.

There is a positive means to figure out from A to B, but not where they went in between. They might have wandered around--

Lage: You know where they ended, but not the course.

Hedgpeth: That's right. And not the exact speed it took them. Of course, sometimes people pick them up a year or two later on the beach. A lot of them get out a little too far, and they just go west. The bottles were given to us by a winery, a whole carload of them. Cute little bottles. We thought of putting a note in them in Russian to the commander of Soviet submarines, "Please return this card via diplomatic mail, we'd like to know your position." [laughter]

Lage: Did you ever get any from distant lands?

Hedgpeth: No, we never did that, we just thought it would be a nice idea. [laughs] Start a little fuss and feathers.

Well, Scripps had been through the silly business of classifying the ocean, and Revelle considered this nonsense. Of course, the cream of the jest was when the *Nautilus* made its first voyage into the North Pole. They had a lot of sounding gear on that thing. They detected something nobody had known about before, namely that in the middle of the Arctic Ocean, starting from Greenland over to Siberia, I think, on a somewhat westerly route, there was a ridge, a rise in the bottom of the sea. This effectively divides the Arctic Ocean into two basins.

There were rumors that this had been discovered and it was going to be named the Peary Ridge, but they didn't think they ought to tell anybody, so it was classified. Of course, at Scripps, hardly anything stays classified; you know what's going on pretty well.

So lo and behold, the Russians start poking around in their subs, and they named it the Lomonosov Ridge, which I think is perhaps more suitable, because Lomonosov more or less organized and sponsored the Bering expeditions in the 1740s. So anyway, they published a paper with the name in the Canadian Arctic Journal with a map and everything, calling it the Lomonosov Ridge, so we were scooped.

Lage: [laughs] We considered it classified, and they published it?

Hedgpeth: Yes. When I was working at Scripps, we had to pass some kind of routine classification just for being there, and if we were doing really critical work, we had to really--of course, I wasn't considered a critical worker. But anyhow, part of my CV is based on the stuff I was required to state, like every place I'd lived in for a period of more than six months all my life. I said, "Well, one time I lived in the old fish hatchery on the McCloud River, now under 300 feet of water." They went around and interviewed neighbors about things they'd picked up on these things.

Lage: So the atmosphere at Scripps was heavily in that direction, classified work?

Hedgpeth: Well, there were things we were not supposed to talk about, like atomic tests and that kind of stuff, but other than that, and the tedium of having to fill out all this paperwork--that's about all it affected me.

Proposed Pacific Gas & Electric Company (PG&E) Nuclear Power Plant at Bodega Bay, 1957-1964

Lage: Let's get into the controversy over the proposed nuclear power plant at Bodega Bay. When did you first hear of it? The story I get is that you had your ear to the ground and heard of it before others?

Hedgpeth: In a way, yes. My secretary at the time, Josephine Alexander, was a stringer for the Santa Rosa papers.¹ She had picked up some of the rumbles around the waterfront that something was going on. She got some kind of a note or remark stuck in the paper with advice from Don--

Lage: The editor there?

Hedgpeth: No, he was a staff writer, I think, at the time. Engdahl. He's somewhat of an engineer himself. So he suggested how she might publish a note that would really stir them out. Well, it did. They said they were interested in securing Bodega Head for--

Lage: You mean you got PG&E to declare themselves?

Hedgpeth: Yes. Of course, they said they hadn't made up their mind whether it was going to be nuclear or conventional.

Lage: Did that concern you early on?

Hedgpeth: Yes. About that time, 1957, there appeared this little article in *Science* about Windscale. Now, one of the things I'm sure is in the Bodega file [in the Bancroft Library] is my *amicus curiae* statement. I submitted a statement pointing out that recent episode in England as recounted in *Science* magazine had spread radioactive iodine to the extent that milk had to be condemned over a fairly large territory, and in *Science* there had been a little map of this. Well, I took this little map and placed it on Sonoma County and Bodega Head, and it went clear over into Petaluma.

Lage: The great milk--all the dairy ranches throughout there.

Hedgpeth: Yes, of course. So I said, "This is the sort of thing we ought to think about."

Lage: So a lot of people initially weren't worried about the nuclear element?

Hedgpeth: I wasn't really worried about it; I said, "I just like to think of roadblocks." Sometimes, I think it all began when my mother

¹In 1992 Jo developed macular degeneration, and in her increasing blindness set fire to her robe while heating coffee over an open gas burner and suffered third-degree burns over her entire body. She survived about a week and gave up when she learned she would require intensive care for a year at a cost beyond her means. She asked that her friends gather for a picnic in Golden Gate Park in her remembrance. We did and it went very well. --JWH.

discovered that PG&E had sent out a dummy buyer to buy the plot next door to her and put in a substation, meaning a whole battery of transformers and wires and a link fence around it, destroyed her view of Mount Diablo from her window. She complained bitterly about that.

Lage: So you weren't happy about PG&E.

Hedgpeth: No, I didn't like their tactics.

Lage: What did you observe with their tactics there in the Bodega?

Hedgpeth: Well, the first thing they did was ask me to come down and talk to them, so I did.

Lage: Was this after you had published some--

Hedgpeth: Yes, I had published this *amicus curiae*, I think it cost me three dollars to file it. Only I didn't call it that. It's interesting to note that I was never asked to mention that afterwards, though I was a witness for Rose Gaffney on the condemnation suit.

Lage: Did you file this with the PUC, the *amicus curiae*, or was--

Hedgpeth: With the superior court, whatever had charge of this in Sonoma County. Not the PUC.

##

Hedgpeth: They must have sent a memo out to their entire staff, "Do you know this person or anything about him?"

Lage: About you?

Hedgpeth: Yes. Because the next thing that happened to me was, they sent Donald Cone to talk to me. Mr. Cone is an engineer who designed high-tension towers and things like that. His wife was an old missionary friend of my mother's.

Lage: Oh, my goodness. So they found someone with a connection?

Hedgpeth: Yes. So they sent him out to cope with me. I just said that I just didn't like the idea of putting that thing in there where it would be nearest our research field, six miles away, upwind at that. He went away shaking his head. But then they approached Robert Burns, who was president of Pacific at the time. They said that I was quite possibly a rather ignorant

fellow who didn't know what he was talking about, which was quite true. [laughter] But I'll tell you why in a minute.

And so it might embarrass the college if President Burns didn't reprimand me and encourage me not to say the things I was saying. Burns told me this.

Lage: Burns told you what they had said to him?

Hedgpeth: Yes. He was a little annoyed by it himself. Which was very surprising, because we always figured Burns was not much but a Rotary type. Of course, later we really had McCaffrey who was a real Rotarian.

Lage: Stan McCaffrey?

Hedgpeth: Oh, yes.

Potential Hazards of a Nuclear Plant

Hedgpeth: Anyway, Burns was a very enlightened character, and he said, "I told them, 'I can't do anything to change his mind.'" But you see, what we did not know in 1957 was that that affair at Windscale had been very bad, and had almost taken off like Chernobyl did, and they caught it just at the last minute. The engineers involved, the scientists, wrote a white paper. They asked to have it distributed in the United States. The prime minister of England said no, that would make them worry too much. That just came out in the last few months, you know.

Lage: No, I didn't know that.

Hedgpeth: Yes.

Lage: So it was much worse than you had suspected at the time.

Hedgpeth: Oh, yes, than we ever knew about. See, the thirty years are up, so the Freedom of Information Act of Britain took effect. It all came out. There were several long articles in the *New Scientist*, and there was an article in *Science*. It has been replaced by Sellafield.

[tape interruption]

Lage: We were talking about how the truth came out about Windscale just recently.

Hedgpeth: Yes. For some reason, I can't find those articles. I don't know where I put them. But you can certainly look up in the index within the last year, I think, for *Science*. Though for a while *Science* did not index its news items. Strangely stupid.

Lage: And this was a news item?

Hedgpeth: Yes. And *New Scientist*, I don't know, I think they do, I'm not sure. But they had much more detail than *Science* had.

Lage: So when you say you were ignorant about it, this is what you were referring to.

Hedgpeth: That's what I meant, I didn't know how bad it really was. Well, I didn't have any idea. Neither did the PG&E. See, what I'd also brought up was the San Andreas Fault, and they made comments saying, "Well, we are looking into this matter." When they got me down to San Francisco to talk to me, they said, "We've just hired a geologist to look into the fault situation." Meaning they hadn't done anything about it before then.

Lage: Was this still as early as '57?

Hedgpeth: It ran on into '58.

Lage: So they had you come down to headquarters and--?

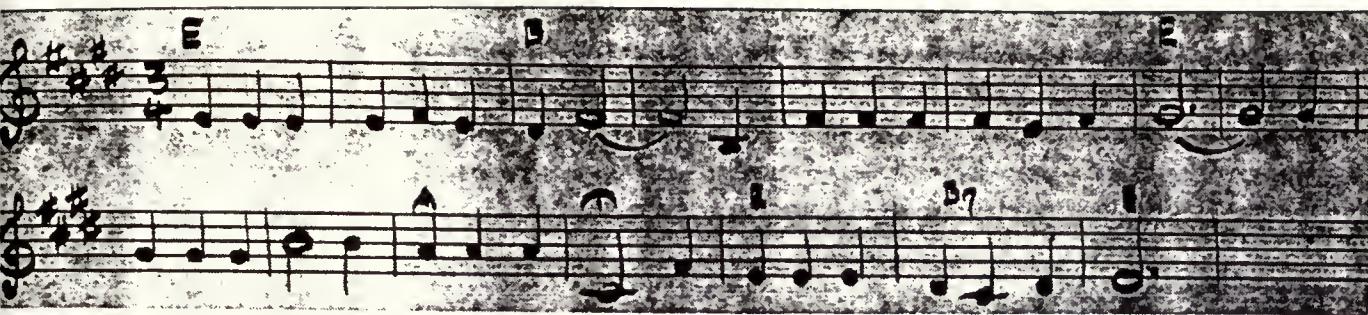
Hedgpeth: Oh, yes. See, they had read that *amicus curiae* brief; it's an open document, especially to attorneys.

Lage: Was it hard to stand up to that kind of pressure?

Hedgpeth: It didn't seem to bother me. Kept me alive, I guess. Of course, I took to my mother's habit of writing verse about things. I inherited my talent for writing satirical verse.

Lage: You have a couple of good poems on Bodega.

Hedgpeth: Yes. Well, actually, they're songs; some of them are, anyway. [See following page, "Ballad of Bodega Head."]



The Ballad of Bodega Head

(An authentic song of social protest)

Music: From a random number table

Words: Anonymous

Allegro Vivace

The Indians lived on Bodega
Their middens are there by the sea—
The Indians are gone, remembered by song,
Will this happen to you and me?

Chorus
Out on a rock called Bodega
There's nothing but granite and sand;
But do not make the mistake of
Thinking this country ain't grand!

The Russians they lived on Bodega
The Eskimo and Aleut, too;
They built a fort up to the north,
The seal and the otter they slew.

Now Gaffney owns part of Bodega,
The Smiths owned part of it too—
All of the rest, the very best,
Is lost forever to me and you.

Oh, this old lady named Gaffney,
Who owns a great desolate strand;
She fought U of C, and the PG&E,
For trying to pre-empt her land.

The courthouse gang is counting
Up taxes beyond all their dreams;
But every delay is a cause for dismay,
As it puts new crimps in their schemes.

Oh, democracy indeed is upsetting
To those whose schemes are delayed;
They find it a bore to listen to folks,
Who ought to be tied and belayed.

So Guidotti and Prather are planning
To skid us all into the sea,
On a road they will build
With the help of the PG&E!

The company's man, old Stan Barton,
Thought up a scheme in the dark:
So he said, when the atoms are tamed,
We'll open the gates for a park!

On to the scene came old Salo,
With drift poles and Rhodamine-B—
He said some went West, to hell with the rest,
I work for the PG&E!

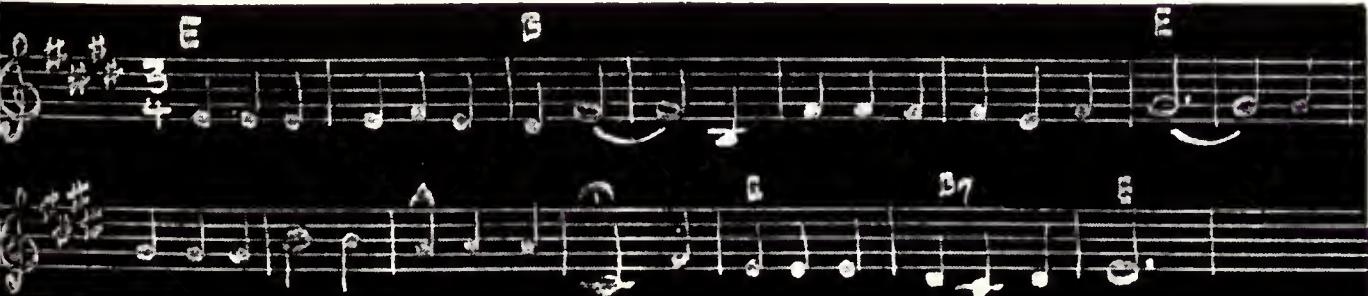
When the hot water leaves old Bodega,
Flows north to Horseshoe Cove—
What will they think when the water turns pink;
That's when the coral reefs grow?

Drift bottles were thrown from Bodega,
Ten each hour for nearly a day.
To Dillon Beach they came, the very same,
Where people study and play.

When hot isotopes leave old Bodega,
There'll be terrible hell to pay—
When the clams in the bay down Tomales way,
Glow bright with the light of the day!

What will become of Bodega,
Dillon Beach and Tomales Bay,
When PG&E puts their stuff out to sea—
What will happen to you and me?

(Repeat chorus)



Public Involvement in the Controversy

Lage: What happened in those early years? I know after the Northern California Association to Protect Bodega Bay and Harbor was formed, things got much more public. But what was going on in those early years?

Hedgpeth: What happened, you see, was that this thing became a matter for local discussion. And of course, the county said, "Look, this will pay half the taxes we need." I pointed out, "Yes, and we will just become vassals to the power company. You won't have a word of your own to say about this matter once they really get going." As a matter of fact, the first thing they did was order the airport out of the way. They had a little airport down on the south end of Bodega Harbor, because their power lines would have to go right through there, and they didn't want that sort of thing around there, thank you.

Lage: Were you testifying at council meetings and that sort of venue?

Hedgpeth: Not then. I wrote letters to the editor of the Santa Rosa paper. In fact, I don't think I ever testified at the town planning meetings about this guy, these people, directly. I've been doing that lately on the gravel business, but that's another matter. No, they held public hearings to explain themselves, since things were getting a little tight for them. I think it was at the Quaker meeting house down here in south Santa Rosa out amongst the orchards. The governor's man--I don't know where they found him--Alexander Grendon [governor's coordinator of atomic energy development and radiation protection]--wanted to talk to us.

He was a gentleman of limited imagination for the impact of the kinds of things he was about to say. He said, "Of course, only the experts will be heard at the Atomic Energy Commission hearings, because you people aren't qualified, are you, to say anything about atomic energy?" A bunch of union guys were there, and they didn't like that kind of talk. They got up and said, "You're insulting our intelligence." The radio station from Berkeley was there at that time.

Lage: KPFA were there?

Hedgpeth: Yes. They had a big Ampex recorder, and they were rolling away. This whole dialogue came down bright and clear. This was about

the time that [David] Pesonen¹ had organized the committee and all of that, Save Bodega Head. So that got rolling, and it was a very popular item down at KPFA.

Lage: This Grendon's remarks, you mean?

Hedgpeth: Yes. He had such a limited mind. Just told us we're all out of order, so to speak, and go home, and let the experts decide what to do about it. That won't go over so good. I don't know where I put the chronology. See, I've written three articles on this thing.

Lage: We can supplement this with some of that, but I kind of want your own personal--

Hedgpeth: Yes. Well, this is my personal--

Lage: Experiences?

Hedgpeth: Yes, as much as this. The exact chronology of some of it is a little fuzzy now.

Lage: Now, that is--?

Hedgpeth: This is the chapter in a book edited by Charles Goldman, James McEvoy, and Peter J. Richardson, *Environmental Quality and Water Development* [W. H. Freeman, S.F., 1973]. I was asked specifically to do this. I was asked to do two chapters.

Lage: This was solely on Bodega--I mean your article?

Hedgpeth: Yes. Well, I have two articles in the book, the other's on estuaries and other things. But I think this is the best one I wrote about Bodega, at least explains what I--

Lage: How you viewed it and--

Hedgpeth: Yes, and I pretty much used my own files. We were all in Goldman's book; Tommy Edmonson of University of Washington is in here, too.

Lage: There we go, "Bodega: A Case History of Intense Controversy."

Hedgpeth: Yes.

¹Oral history with David Pesonen, who led opposition to nuclear power plant at Bodega Bay, in process.

Lage: Okay. And W. H. Freeman, yes.

Hedgpeth: Yes, I put that marker in there. Of course, that was just for a copy for my own purposes, to copy a title page, in other words. This chapter is twenty-five.

Lage: Okay, so this is a good supplement here.

Hedgpeth: Yes. See, I wrote three articles all told. One of them, is in the *Bulletin of Atomic Scientists*, "Bodega Head--a partisan view."⁴

Lage: I think I've seen that one.

Hedgpeth: Yes, that was kind of funny, because Steve Obrebski was working on his doctorate at Chicago at the time. I think it was he who suggested selection of certain verses; I didn't. It was from the Ballad of Bodega Head, especially the one about out on the rock of Bodega and a professor named Hand.

Lage: Now, tell me more about this--

Hedgpeth: Tearing his hair, and the fauna ain't there, and the isotopes splatter the land, or something like that.

Lage: Do I have a copy of that? You gave me some verses here.

Hedgpeth: I think it's in *Poems in Contempt of Progress*, I gave you that. That was one of the better verses, though I think the best verse was written by one of the grad students there at the time, namely Bob Hamby:

"The mutants converge on Bodega,
And lumber right out of the water;
Both saprophytic and hermaphroditic--
Would you want one to marry your daughter?"

Lage: [laughter] That's wonderful!

Hedgpeth: PG&E didn't know how to deal with this kind of stuff.

Lage: How did this get spread around? Were these poems published in the local papers?

Hedgpeth: I don't know what happened. Malvina Reynolds got hold of them, and she was--actually, when the fight was all over, she wanted to hold a program, and she offered the PG&E equal time for their

⁴See also "The Battle of Bodega Head," *Per/Se*, fall 1966.

Reddy Kilowatt commercial. They threatened to sue the station and her and everybody else--

Lage: Oh, this was KPFA still?

Hedgpeth: Yes.

Lage: Did it ever come off?

Hedgpeth: Well, after the PG&E caved in, a lot of us wound up down at the KPFA studio rather late in the evening, I think, slightly perhaps influenced by a certain carbohydrate. A lot of those things got sung, including possibly some slightly off-color things as well. I just wonder--of course, those were the days when they recorded on great big platters--whether that's kicking around anywhere or lost long since.

Lage: Was Malvina Reynolds for that--

Hedgpeth: No, she wasn't there, I don't think. But she was at our victory banquet. I think I've got a picture, I don't know. I think I have a picture of her standing up there with her guitar at the podium.

University of California's Involvement

Lage: Tell me more about the connection with UC and what you observed about the university's response.

Hedgpeth: Very early in the game, at a time when Cadet Hand was on a sabbatical in New Zealand, I was approached by George Papenfuss and Ralph W. Emerson, UC professors of botany. They said they'd planned to build a laboratory out there, and PG&E wanted the property; they were trying to stop that. Ralph Emerson told me --see, he was assistant to the chancellor at the time--this was a rotating post to give professors experience in administration. They hadn't really any authority. He had written a protest and said it ought to be appealed to the governor, and this was an obvious collision course between the PG&E and the university. The university had announced for some time they had planned to build a laboratory out there.

So they said they wanted me to be the director of it, and I said, "Well, I don't know about that."

Lage: When they came to visit you they--?

Hedgpeth: No, I was out in Berkeley, we were all walking down the hall in LSB [Berkeley's Life Sciences Building] in that one. Then Emerson's tour of duty ended, and Starker Leopold got put up [assistant to the chancellor]. Starker was sort of ambiguous about this. He was a bit more concerned with political aspects and pleasing the guys upstairs.

Lage: Did you observe that in other cases, or just in this one?

Hedgpeth: Well, mostly in this one. Because usually you get a bit stronger. I heard some rumbles; I never asked Luna about it. These rumors came to me that the family wasn't speaking to each other on this thing.

Lage: On this Bodega thing?

Hedgpeth: Yes, they strongly disapproved of Starker's position, that he was playing the game of the administration. But I never had any particular dealings with Starker one way or the other on that point. I was his T.A. when I came back to Berkeley to finish up the Ph.D. I had started at Texas.

I T.A.'d a course I knew the most about, was more or less given my choice of two or three. They were trying a joint course with Paul R. Needham [professor of zoology] and Starker Leopold; he would talk about upland game and stuff, and Needham would talk about trout and salmon and so on. I knew Needham from the field, even though I didn't work under him at Shasta Dam. He came bouncing in and out. He was pretty much the club booze boy type. He was surprisingly ignorant of zoology. He asked me to write his syllabus. All I did was hoke it up out of the *Encyclopediæ Britannica* and a couple of textbooks.

I took it down to Stanford one day and showed it to George Myers, who was one of our best ichthyologists. He looked at it and he said, "Paulie couldn't have written this." He looked at me and he said, "Oh." [laughter] So I said, "Well, it's nothing you couldn't find in the encyclopedia."

Well, anyway, he would get up and talk about the "lacriminal" (Needhamese for lachrymal) bones and the "gill rakers" of whales and stuff like that, and didn't know any--. Of course, Starker was much more competent than that.

Lage: Starker had his troubles with the Museum of Vertebrate Zoology, I thought.

Hedgpeth: Yes. They were relieved when he shifted over to forestry. He went over to the Multiple Use Department, they called it.

Lage: Well anyway, he became the vice chancellor in place of Ralph Emerson.

Hedgpeth: Well, it's not vice chancellor, it's assistant to the chancellor. It's a very different thing. These people are not permanent. They only do it for two years at a time or something, I think. It might have been some guy out of the English faculty would succeed him.

Lage: His scientific qualifications had no bearing?

Hedgpeth: No. It's just kind of a post for administrative experience. So he was the person delegated to try to calm Pesonen down. Pesonen refused to meet him in his office, so they had discussions out on the lawn. [laughs] He called him Professor Loophole. [laughs] I don't know whether he printed that name or not.

I contributed to this merriment myself; after it was all over, about 1960, I was asked to talk to the joint American Fisheries Society and Wildlife Society meeting in Fresno. These guys always met--see, these were mostly the outdoor types, fish and game and so forth, fly fishermen and all these sorts of characters. At that time, they had this guy named Ray Arnett in charge, who was a big bulking hulk of a man about six feet eight. He was in charge of the fish and game. He was telling them they shouldn't discuss any of these matters in public, because they were state business.

I said in my talk, "Well, if you don't like your job, you can always quit." Of course, those were the days it was possible. About that time, Arnett got up and stalked out of the room. But at the beginning, Starker gave a very good talk.

Lage: At this same meeting?

Hedgpeth: Yes, and he said the state water plan made no ecological sense whatever, which was quite true. So at the bar afterwards, a couple of the young fellows came up to me and said, "What made Dr. Leopold say that? That's the first time we ever heard him talk like that." I said, "Well, I think Starker has finally realized he's not going to be appointed secretary of the Interior, so he might as well say something sensible." Which was dirty pool of me, I must admit. [laughs]

Lage: But that was the impression you had, that he had ambitions--

Hedgpeth: Oh, he was very--he was a friend of Udall's and all this, and he was very definitely engineering for the post. Then since he

didn't get that, he wanted to be on the Fish and Game Commission, and they appointed Ray Dasmann instead. I think that hurt him, too. Ray and he had been graduate students together. Of course, I knew him way back then.

Lage: Give a little overview, now, what the--I don't think people who aren't so familiar with it are going to get the story, that the university switched its position, or what kinds of statements did the--

Hedgpeth: Well, they decided--well, they could live with this power plant.

Lage: It could coexist with their proposed marine station?

Hedgpeth: Yes, well then they put in a bid for \$2 million or something to the National Science Foundation to build it.

Lage: The university did?

Hedgpeth: Yes. And I was asked to be on the committee.

Lage: With the National Science Foundation?

Hedgpeth: Yes; I was a member of the facilities panel at the time. I said, "No, thank you." I didn't want to get mixed up in this any more. So I stepped out. But the grounds on which they gave it, they said to me, "Well, if anything happens, at least they can study the effects of the power plant." [laughter]

Lage: So it would become a marine station to study the effects of the power plant.

Hedgpeth: Yes. By that time, Cadet had been named the director apparent or whatever you call it--

Lage: Now, what was his role, Cadet Hand's role? You said he was away.

Hedgpeth: Well, he was off on his sabbatical, but when he got back--

Lage: What position did he take?

Hedgpeth: I think it was primarily to--obviously on the suggestion of the higher administration, that if he didn't do everything he possibly knew to keep me out of this brawl, he wouldn't get the job.

Lage: So he wanted to be director of the station?

Hedgpeth: Yes.

Lage: Did he put pressure on you, then?

Hedgpeth: Oh, yes, sure.

Lage: What were his arguments? In a face-to-face discussion, what would he say to you?

Hedgpeth: One of the things that happened was kind of funny. I didn't intend that at all. But an idiot from the *Daily Californian* called me up, and this was when there were rumbles that the administration of the university was in bed with the PG&E, except I think they were, but anyhow. He said, "What do you suppose happened?" I said, "You know, well, these guys are all strong on being old lodge brothers, and I'm sure that Norm," meaning Norman [R.] Sutherland [PG&E president], "called up Clark Kerr and said, 'Clark, this is Norm.' So on and so forth. 'You got some faculty over there who wants the same thing we want, namely to build something on Bodega Head. Why don't you encourage them to shut up or something?'" So he published this damn hypothetical conversation in the *Daily Cal*.

Lage: Did he publish it--

Hedgpeth: Just about the way I put it. Norm calls Clark and says, "Move over, we want the headlands," and Clark says, "Yes, sir." Words to that effect. Some idiot from the chancellor's office says, "Fortunately, it can't be proved." Putting the word "fortunately" in changed the tone of the whole thing, you know, suggested we hope there's nothing in the files. [laughter] So Cadet says--came around to talk to me, "Well, you really balled it, we're not going to be able to do anything with you now." Words to that effect. Of course, I've insinuated in this thing, because I refer to the Faustian bargain in here.

Lage: Well, all the things that you insinuated but didn't say, this is your chance to say them, rather than just insinuate.

Hedgpeth: There's a lot of people who think Cadet kind of sold his soul on this business. What he wound up doing afterwards is very significant. He spent about three-fourths of his time working for the Atomic Energy Commission. He was on their committees to appraise things and I think they even made him an administrative judge for a while. Seems to me I saw that. He was never around Bodega; he just sort of withered on the vine until they--

Lage: Did he not become director of the station?

Hedgpeth: Oh, he was director, but he didn't direct. He didn't fight for a budget or anything. He just wasn't around. At one point, Charlie Goldman asked me if I wanted to be acting director for a year during Cadet's next sabbatical. I said, "An acting director can't do anything. Probably even has to have somebody else sign his budget. Not what I consider a very interesting thing to be doing," especially since I didn't seem to have much budget anyhow. So the people at Davis got very upset about the whole thing. They wanted to get rid of him outright. They finally did, and with Sea Grant funding moved in. They ousted him, essentially, and put in [James] Jim Clegg, who seems to be a good man for the job at this point. So then Cadet was asked to come back to Berkeley to teach zoology. He took early retirement instead.

Lage: You don't think he realized the position he was being put in?

Hedgpeth: No. Well, I try to be reasonable about this, but it's pretty hard.

Lage: Do you have anything to say about--you testified at the PUC hearings, didn't you, in '62?

Hedgpeth: Yes.

Lage: Did you answer some of the university's statements at that point?

Hedgpeth: No, I never asked for them or anything. I just testified about oceanographic aspects. Part of the evidence was that the water would go away to the sea.

Lage: Wouldn't just drift on out?

Hedgpeth: Drift on out, yes, away. And I said, "Well, at Bodega Head it would drift in toward the shore." An old attorney with lavender glasses, Morrissey, said, "Are you trying to contradict Dr. Salo's testimony?" I said, "No. What Dr. Salo was using was a pole eight feet long with a weight on it--"

##

Hedgpeth: --the head, the water at the surface could move in the opposite direction from the water eight feet below, because it was that water which was being moved by those poles. He didn't expect that, so he sat down. And they asked me, "In view of all that you've said, do you think the university would be wise to have this power plant?" I said, "Not unless they had absolutely complete control of it." No, that wasn't a very good answer. I

should have said, "Hell, yes," but I didn't want to say that right out loud at that point.

Anyhow, got to the end of it, old Morrissey said, "Well, that was good testimony." Which is lawyerese for saying, "I wish you weren't here," I guess. [laughter]

Opponents to the Power Plant

Hedgpeth: Another time at the end of this whole brawl, the state had a hearing, the legislature, a joint committee. What were we going to do? Part of this whole thing was the unplanned way in which the PG&E could move in and do this thing, they ought to have a siting policy and all that sort of thing. And Mrs. [Jean] Kortum was there. She was trying to testify to the pressures put on Karl [Kortum], who was director of the Maritime Museum. The chairman said, "We can't take that as evidence. You refuse to say who these people are," that had made life miserable for them.

So I got up. I said, "Well, there have been times when President Burns of the University of the Pacific has been pressured, I believe, by fellow lodge members who have approached him on the matter, but of course, this is all bound with the vows of lodge secrecy, you know," and they all sat there and they knew damn well that the vice president of PG&E was a grand master one year, and Burns was chaplain for the Masonic Lodge. That kind of crap. They knew exactly what I was saying; they didn't say, "Well, go on out of here." They all snickered and turned to the next speaker.

And then some woman got up and started a harangue about a big power line going over her house, or too near it, and so we all had to walk out between those narrow doors of this building, and I found myself walking beside Morrissey, the chief attorney for PG&E. I said, "You know, I see you've got another fight on your hands." He looked weary and said, "Oh, yes." I said, "You must think of us folks like a lot of crabgrass, sprouting up everywhere."

He looked at me and said, "I've never thought of you as crabgrass." I didn't ask him what he really thought. [laughs]

Lage: You should have gotten him to elaborate.

Hedgpeth: Yes. Of course, going around with tape recorders running in your vest pocket or something like that. You never can tell when these moments are going to come up.

Lage: Well, it did capture people's imagination.

Hedgpeth: Yes.

Lage: And opposition really seemed to just sprout up everywhere.

Hedgpeth: Right. Well, the townspeople didn't like some of the ways they were being pushed around.

Lage: Do you remember some of the local people who took a leading role in it?

Hedgpeth: Well, Bill Kortum was not one of them. I think he was still practicing veterinary medicine at the time.

Lage: He didn't speak out as much as Karl?

Hedgpeth: No. Bill has a problem, he has a very soft voice, and his effect at public meetings is very poor as a result of that. It's sad, but true. Karl has been a deep water sailor, and he has a very loud voice. He can be heard. Of course, I have a trained voice, and I can be heard, too.

Lage: [laughs] That's always an advantage. What about the--gee, that's a long name--Northern California Association to Protect Bodega Head and Harbor? You were in on the founding of that, it seems. Was that founded before David Pesonen came on board?

Hedgpeth: Well, he founded it. He came aboard--see, when he was writing for the Sierra Club Bulletin, they sent him in to make a statement on behalf of the Sierra Club. I've never asked him directly about this, but I think that's one of the things that set him off to study law. The next thing that happened was some guy from the floor was starting to attack him because his father was known as a dangerous radical.

Lage: During the testimony at the PUC?

Hedgpeth: Yes. Dave looked at the chairman and said, "What is all this?" There's an obscure book called the *Transactions*, or whatever, of the governor's water conference in 1945, and Dave's father has a statement in there about nature and fish and so forth. Right now, it would be very fashionable. He was representing at that time the Unitarian church, I think. That must be the kind of thing they didn't like. One of the few dissenting voices in

that '45 meeting. That's where Earl Warren said, "We must put every drop of water in California to use," or to work. I gave you that squib, I think.

Lage: I think you did.

Hedgpeth: Pointed out it sounded an awful lot like Joe Stalin.

Lage: But there were people in opposition, even then.

Hedgpeth: Oh, yes. Well, of course, the Tyee club and those people, but they weren't given very much space.

Lage: Okay. How did you observe Pesonen's role, and the work he did?

Hedgpeth: Oh, he worked full-time for several years, writing these--always writing these position papers or statements, a whole blizzard of this kind of stuff. I even joined in and wrote a couple that annoyed him now and then. They all have to be formally answered in the Public Utilities Commission ritual, and so forth.

Lage: Anyone else who had a leading role that you'd want to talk about? The names I noted here were [Joe] Neilands, the UC professor--

Hedgpeth: Yes. He was a real wild one, of course. Don't know whether he's communist or not. Of course, he's a full-ranked professor on tenure. I don't know whether he's a member of the National Academy or not; he may be. He's a biochemist. He's kind of a funny guy. [laughs] I was invited to his house for dinner, and I was standing there on the stone doorstep. It had a fish worked in pebbles on it. Old Neilands opened the door, and the light went on, and I said, "I didn't know you were a Christian." He said, "What the hell are you talking about?" I said, "You've got one of the first symbols of the Christian church on your doormat here." [laughing] He didn't even know it!

[looking through papers] This is the way Herb Caen treats information.

Lage: This is an '82 Herb Caen column. [October 1, 1982] Here, you read it. Oh, you don't have your glasses, I'll read it. [reads] "Joel Hedgpeth recalls a Tosca in 1913," and you say here 1928. You would have been two years old in 1913.

Hedgpeth: I know. Well, that Frank Pitelka saw me a day or two after that, and said, "I didn't know you were going to the opera so early." [laughs] I don't know if Herb has just got his date mixed up. Because that was a very well-known performance;

that's where she had not done any dress rehearsals, and she's a tall woman, statuesque, blonde, and Scarpia was a little Italian fellow about five-two. When she agrees to be his lover, if he will just load blanks in the firing squad so her boyfriend wouldn't have to die and all that stuff, well, at the end of this confab, she heaves herself into his arms. She does this physically, and he wasn't ready for it, so he's tottering on his heels in a backward direction. There was this old sofa in the middle of the stage, and steered for that. So the two of them hit it simultaneously, and all four legs broke off of this thing. A cloud of dust, and somebody behind the scene freed the lines on the fire curtain; it came down with a great crash, and it obviously hadn't been unrolled for a decade or two.

Lage: And all the dust--

Hedgpeth: Oh, and the dust, a great cloud of dust! Then somebody got the fire curtain back up, and by that time, they turned on the stage lights--or no, they hadn't turned them on yet. They were dark, they were behind a curtain. Jeritza was reaching around for her wig--of course, she had on a black wig so she would look properly Eye-talian--she found it, got up, and made a Mae West exit offstage waving her fanny at the same time she was waving the wig, and we all yelled for an encore. Scarpia was still groping with the furniture; he'd really got tangled up with it.

So finally, after about five minutes or so, they got unscrambled and resumed the opera. [laughs] I've never been able to take Tosca seriously since.

Lage: No, I wouldn't think so. Okay, anyway, back to Bodega. Are there any other incidents that you think you should mention that maybe you haven't written up, or do you think you have said your piece on Bodega?

Hedgpeth: Well, I don't know if everything ever will be said.

Lage: It seemed to fit very well with your views that you'd already stated about progress, and technology. Is that one of the things, aside from the hot water coming into Tomales Bay, is that one of the things that affected you?

Hedgpeth: I guess. Oh, here we are. This is only one page, it looks like a three-page letter, from Neilands to I don't know who. It wasn't to me.

Lage: This is '64. This is after you've won the battle.

Hedgpeth: Yes. This is Neilands trying to explain some of the things, and I don't know whether that's of any use--

Lage: Yes, that would be good.

Hedgpeth: I don't know what ever happened to the rest of it. I may find it, and I may not.

More Citizen Activists

Lage: Too bad it--yes, it seems to stop in the middle. What about Harold Gilliam? Was he very active in all this?

Hedgpeth: He wrote a couple of pieces about it, and he attended the hearings when he learned that any citizen can get up and interrogate these characters, he--

Lage: That's the interesting thing at those hearings.

Hedgpeth: Yes. He asked a few pertinent questions. [laughs] A very silly matter, some sharp kid got up and pointed out that the chief engineer had made a statement that the base of the tower platforms where there would be overhead wires were going to be twenty-five square feet. He meant twenty-five feet on the square, which is a difference of several hundred square feet of space involved. He got the guy, the poor old engineer, absolutely flustered, and he pawed through his briefcase, and he said, "Well, I'm afraid you're better at arithmetic than I am." [laughs] Rosie, she just took them apart. One time--

Lage: Rose Gaffney?

Hedgpeth: Yes, well, she gave testimony about the lovely place of Bodega, and how the Indians used to live there, and all this stuff. Then she got up again and the PG&E attorney, who was a character, for stupid remarks, asked, "What's this, more history?" She said, "No, this is combat."

Lage: She said this! [laughter] This was the woman, just for the tape here, who owned the land, I guess her land was condemned for the--

Hedgpeth: That's right.

Lage: And she was quite a figure, I guess, from what I've heard. Did you know her very well, or you got to know her through this?

Hedgpeth: No, I knew her. I had met her, good lord, going back to the 1930s.

I had a tablemate [not Rose] taking a zoology course, or a deskmate or whatever you call it there, and she was a Big-C type, physical ed major.

Lage: She went to the university?

Hedgpeth: Yes. Well, she shouldn't have been in that course at all, she realized. She barely got a D out of it. But she selected as her term project to write up Horseshoe Cove, and she wanted me to go along with her in the morning. She lives over in Napa, she's a very robust, Germanic type. She's getting troubles now and has to drive around in a golfing cart. But anyhow, she went out there, and there was Rose with her baseball bat--

Lage: Did you go out with her?

Hedgpeth: Yes. Well, she knew Rose, apparently, so there was no problem. They had a conversation. Yes, well, Bodega Head is no place to go out alone; you've seen what happened this last week.

Lage: No, I didn't.

Hedgpeth: Well, a very sad thing. This woman, thirty-three years old with two small kids, dropped her binoculars over the edge and reached down to get them, a sheer cliff about 150 feet, killed her.

Lage: Oh, my goodness. Did the cliff collapse?

Hedgpeth: No, she just got out of balance, moved a little too fast, probably. That sort of thing shouldn't happen. Now there's a big sign saying--

Lage: There are lots of signs.

Hedgpeth: --"Stay back from the edge." People don't believe those signs. So anyway, life out in Bodega Head can get rough, so you're well not to be going it alone unless you really know what you're doing.

Lage: Several things came up about the road that was built along the tidelands.

Hedgpeth: Yes.

Lage: Did that change the ecology significantly from your point of view? Was that a travesty in itself?

Hedgpeth: I don't think it did really, because the route is right at the edge. It might have changed something for some critters, but you see if you've been there, it's pretty well far back from the water. But what it did, apparently, was it added weight from the traffic, and it slumped... [tape interruption]

Lage: So, the road.

Hedgpeth: Yes. Oh, there was a meeting with the Corps of Engineers that went on and on until one a.m. in the Grange Hall at Bodega. Now these hardy old fishermen got up and said the road will force the mud to sink in and fill up the ship channel.

Well the chicken-colonel type from the Corps of Engineers-- see, these fellows serve for three years at a post, and they always hope to be able to go to Washington and get a star, in other words, become a general. So they have to be very careful how they conduct things. Well, the thing is, it takes them two years and eleven months to learn enough about San Francisco Bay and the area to be intelligent.

So anyway, he said, "We can only listen to testimony of qualified experts, and what you are saying cannot be considered."

Lage: What the fishermen had to say?

Hedgpeth: That building a road along the shore would push mud into the channel. These were guys that lived around there all their lives. So two years later, why, they built the road, and the mud moved out and shallowed the bay and filled up the channel, and so they wanted to bill the County of Sonoma for having to redredge the ship channel.

Lage: Did it get brought up at the time?

Hedgpeth: Oh, naturally. Well, brought up that they--.

Lage: That they'd been warned.

Hedgpeth: Yes.

Lage: So you didn't have any problems from the College of Pacific, then, from your role on Bodega?

Hedgpeth: No. Well, one of the things I think I told Dr. Burns was--see, PG&E handed out money in fairly good little lumps to various independent institutions. I think Pacific's take was possibly \$5,000 or something like that. I said, "Of course, they don't

dare cut back on that. They'll be placed in the position of having discriminated against the college on account of me, and that's the last thing they want in their publicity."

Lage: So he didn't--

Hedgpeth: Yes. He agreed to that. I don't think anybody over at Pacific was very much worried about what I was up to. In fact, it was difficult to get some of them interested in coming out to the beach at all.

Lage: So you were kind of left on your own?

Hedgpeth: Yes, I was on my own, pretty much.

Lage: But they did fund you? You didn't have to raise funds to keep your work going?

Hedgpeth: Yes. Of course, I got--

Lage: You got grants.

Hedgpeth: Yes. This NSF thing had a fair amount of money for maintenance and running expenses, especially the boat expenses and so forth.

Leaving Pacific Marine Station

Lage: How did you happen to leave Dillon Beach?

Hedgpeth: Two things. One of them is the vice president said that the salaries were never going to rise above \$12,000 at Pacific, and it was already obvious that that wasn't very much money any more. They offered me a post at Oregon for considerably more than that. What they didn't tell me there was that they expected me to raise \$650,000 a year--

Lage: They didn't tell you that when they hired you?

Hedgpeth: They did not.

Lage: Oh, my goodness. That made a change in--

Hedgpeth: Of course, the other thing was an extraordinarily crazy administrative arrangement of the laboratory on the coast there.

Lage: Maybe we'll save that for next time, and start with Oregon, instead of getting into it now, because I'd like to talk about it, and I think we've covered things well today.

[After nine years on the Oregon coast my fingers became arthritic and I had to give up harping. And it would seem, a bit arthritic in my memory. Belatedly, after all the sessions that resulted in this memoir, I realized at the last minute that I had completely forgotten the festive event of my seventy-fifth anniversary banquet held November 14, 1986 (perhaps because it was not held on September 29th) at the aquarium in Monterey, arranged by Bill Davoren and his Bay Institute and Bill Kier. Among those who were present was Karl Kortum, who considered "impossible" an unnecessary word. Certainly he salvaged more wrecks for museums than anyone else, and changed maritime museums from collectors of ship models to the real thing. In his life, he made many more friends than enemies. He was indeed a person about whom nil nisi bonum could be said with a will, and was so characterized at his memorial service on the *Balclutha* October 27, 1996.

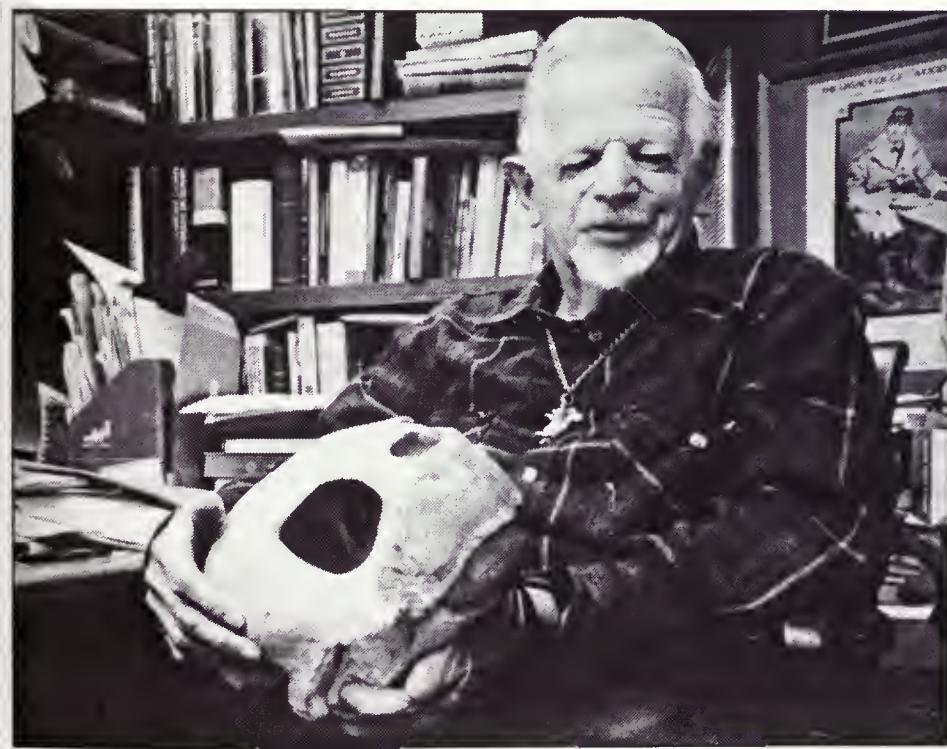
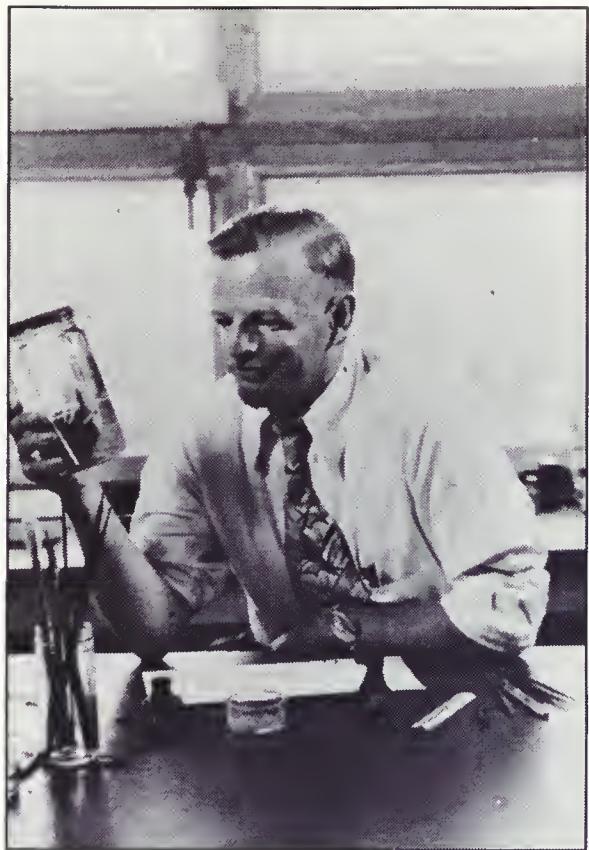
--JWH, added during the editing process.]



Joel W. Hedgpeth, ca. 1960.

Photograph by Otto Hagel

Joel W. Hedgpeth
at Dillon Beach,
ca. 1960.



Joel W. Hedgpeth
in his study,
Santa Rosa, 1992.

VI MARINE SCIENCE CENTER AT OREGON STATE UNIVERSITY, 1965-1973,
PYCNOGONID RESEARCH, AND ANTARCTICA

[Session 6: October 29, 1992] ##

Program, People, and Problems at the Yaquina Biological Laboratory

Lage: We're going to start today talking about your experience as director of the Yaquina Biological Laboratory at the Marine Science Center at Oregon State. Last time, you told how you happened to head up that way, and I'd like you to give some idea of the program and the setting.

Hedgpeth: Yes. Well, this is going to lead to some rather--fortunately, the principal character is now deceased.

Lage: So you're going to be candid.

Hedgpeth: His name is Wayne Burt. Well, I didn't know until--see, I was directing Dillon Beach, the marine lab, up through the summer of '64 at least. Dr. Burt passed by on a visit and looked at the setup. Of course, I had been on a number of National Science Foundation panels, systematics and facilities mainly, but also on one for the Office of Naval Research, which was a fairly interesting one, since it was the navy's idea of trying to avoid the taint of being military. Actually, the original Office of Naval Research was something of a model which the National Science Foundation followed later.

Dr. Burt wrote me a very fancy letter offering me a job. At about that time, the vice president of [College of] Pacific said he was going to try to keep faculty salaries under \$12,000, and didn't think they'd ever have much more. I was making about \$10,000 or \$11,000 at the time. I think they've had to change that rule or they wouldn't have anybody at all.

Lage: I would hope so, by now.

Hedgpeth: Yes. Well, they almost went on the rocks there for a while, but somehow they've gotten some help. So that wasn't very encouraging. So Dr. Burt offered me a good salary. They were building this lab at Newport, Oregon, which he wanted me to direct. It was a field station.

Lage: So it was a new lab, a new--

Hedgpeth: Oh, brand-new, yes, and Burt said a whole lot of things about the local school, which later turned out to be not very accurate, about how it had a class-one high school. Well, it was a class-one athletic school. They didn't mention that, and I didn't know that's the way they graded them up there. I didn't know, and he never told me, that he expected me to bring in something like \$650,000 a year in grants, though he may have told others.

Lage: That seems like a crucial bit of information to impart before you take the job.

Hedgpeth: It was indeed. So I arrived up there, and it was a rather interesting setup. I think I have a program of the dedication ceremonies. There's a rather big sprawly building designed jointly with the fisheries and wildlife department on the Oregon State campus. They had charge of one wing, and I was supposed to have charge of the other. But everything you did, including buying a box of paper clips, had to be cleared at Corvallis fifty-five miles inland, and that was some fifty-five miles. I think there was estimated to be at least three hundred sixty-five curves in the road. The highway department proudly announced once that they were cleaning it out at the rate of one curve a year, which didn't promise well for the long run. In winter, it's a bad road, it's very dangerous and snowy and all that stuff.

Lage: So you were very isolated.

Hedgpeth: Yes. And nobody on the campus wanted to come out there. They used it for a boat dock. They would come out, they'd get on the ship, stop for supplies or something. I was never invited on a cruise. It was assumed that all I was supposed to do was--and as I say, I didn't know this--get money. I was considered by some of the people as competition for funding, which of course it would be, since it was a soft-money institution. I was never asked to serve on a campus Ph.D. committee; I had no students unless they were supported by my own grants.

Lage: Who were you in competition with?

Hedgpeth: My colleagues in the Department of Oceanography, to begin with. And any other department that might be doing something at sea or in the bay. In fact, once I noticed that the engineering department was conducting studies of tidal action in the local bay there, Yaquina Bay. Since I was interested in promoting some studies in estuaries, I asked Dr. Burt, "Can't we join forces?" He said, "We're an open game here; it's every man for himself."

Lage: That's not too encouraging.

Hedgpeth: No, and the other thing was that they had found a fellow named Tom Scott to be the director of the fisheries wing. He may be-- I don't know whether he's still alive or not.¹ He's a great one in the Rachel Carson Foundation, a fisheries biologist from inland somewhere. But the fellow who was asked to be M.C. for the thing was John Byrne, who is now president of Oregon State University.

Lage: Is this the M.C. for the dedication?

Hedgpeth: Yes. And he completely forgot to mention Dr. Scott in introducing all these innumerable characters and subcharacters that turned up at the dedication. Incidentally, the governor of the state at that time, Mr. [Mark] Hatfield, had not come to the dedication. The place is now named for him. The reason for that is, while he was on the [congressional] appropriations committee, he developed this delightful habit of bypassing the National Science Foundation and giving direct gifts to the universities. So he kept giving us buildings but not any support for staff.

Lage: Buildings for the whole university or for your lab?

Hedgpeth: No, he specifically gave funding for the laboratory, to build it up. Actually, what had happened when the oceanography department was set up, Dr. Burt hired anybody he could find, and he had a couple of people he never could get rid of. They were pretty dull and so forth. So when I looked over the plans of the layout, I noticed there was no still. I said, "What gives here? Every laboratory I've ever heard of has to have a still. If you're going to work any kind of chemistry, you've got to have your own supply of distilled water." It's a very simple matter, actually. You could buy an adequate still for three or

¹I saw his obituary not long ago. --JWH, October 1995.

four hundred bucks. So it was very strange in light of it, there wasn't even a place for plumbing for it. So they had to rearrange for that. There were other funny things about it.

Then they had a man in charge of the physical plant, and he was palsy-walsy with one of the resident fishery characters there, and so anything he didn't like, he would call up Tom Scott or the dean of fisheries and agriculture and complain about it. Then the complaints went back to Burt, who was supposed to be in charge of the whole thing. Burt finally had to fire this guy, he was such a pest. I remember once asking him for a pencil sharpener. It took me about four weeks for him to get it and stick it on the wall. Just plain ornery that way.

All that kind of stuff went on. I was told later by some fellow who had signed a couple of Dr. Burt's letters for me in his absence that he wanted to tell me what was going to happen when I got up there. The place was remarkable for the number of people who didn't stay around, who were first-raters gone off to Princeton and Stonybrook and similar such places.

It was not a very good situation, because even the people in the biology department felt that you were their enemy, that I was brought in to build the place up at their expense.

Lage: So there wasn't a cooperation even with biology?

Hedgpeth: No. Oregon State at that time was rather uniquely arranged. The only common stock room was chemistry. Biology didn't have its own stock room, nor govern its own allocations of microscopes and things. These were all built up by each professor separately under his own grant applications.

Lage: You can see that leading to a lot of competition and empire-building.

Hedgpeth: Well, it did. So what I tried to do was get these people together and agree to come out and help me, the kind of thing I'd built up at Dillon Beach, namely a summer training course for teachers. Not so much training as participation in projects. Well, I got two or three bids from these people. Turned out what they were doing was simply stocking up their own personal stock rooms.

Lage: How was that?

Hedgpeth: Well, if they wanted a new microscope, something like that, or supplies and laboratory apparatus and things. In other words,

you have an allotment on the grant for the projects, so that's what they were doing with it.

Lage: Instead of thinking about teaching at--?

Hedgpeth: Yes. So the height of it was this guy who had gotten his degree from his father at Harvard, and he needed a mass spectrophotometer. It's about a five or six thousand dollar item, and it looks more or less like a refrigerator. It doesn't look very much like anything, as a matter of fact. All the gizzards are inside. But it's essential if you're doing some various biochemical work.

He never came out there, I never saw him. The thing was delivered to Newport, Oregon, and installed in the room he was supposed to use. One dark night when nobody was around, he came over with an assistant, disconnected it, and trundled it off. We didn't even know it was gone for about a week or so, because we didn't go into that room very often. That's the way he treated the deal.

Lage: And never came out to have students or do research?

Hedgpeth: No. Well, you see, nobody applied for it that year; well, that's luck or something, you know. And maybe he just didn't advertise. Well, actually, we had two or three good fellows there. One of them now is the top man in the Oregon State system for biology instruction. In fact, my daughter worked with him for a while. She's been asked to deal with the K-12 biology, physiology curriculum.

Lage: In Oregon?

Hedgpeth: Well, not in Oregon, in the Beaverton [school] system, which is one of the largest in the state and one of the best financed. Oregon has a very undesirable situation. I think it's even worse now. The budget has to be voted on by the public every year.

Lage: By the public?

Hedgpeth: Yes. And so the continuity of many of the smaller school systems is very perilous and doesn't work very well. That's one of the undesirable aspects of things. They had a--

Lage: So this is the local school budget which is voted on by the local communities?

Hedgpeth: Yes. So we had these hearings and so forth. I was there one evening--[laughs] the biologist, I think in the school in our town, had asked for three aquarium tanks. One of these people from the taxpayers' league, I think they lovingly called themselves, said, "What do you want to do with all those fish tanks? Two would be enough." So I didn't even get up to speak; I just sat there and said, "Yeah, if you try to put all those fish in those tanks, they'll eat each other up, you know. You've got to separate them." The chairman said, "Well, you've heard from the expert." [laughter]

Lage: Did he get his three tanks?

Hedgpeth: Yes, he got his three tanks. What the heck, they were about twenty bucks or something.

Lage: Gee, that would be red tape to the nth degree.

Hedgpeth: Oh, yes, a fight down to the last thumbtack, you know.

Lage: Did people look over your budget process at the marine lab to that degree, or were you pretty free up there?

Hedgpeth: Well, no, actually. We ran into some weird stuff in the building. One of them is that--see, you were handling sea water, so you can't use any copper. In a sea water system, if you're going to keep live marine critters, very little copper will kill them off. So we had these plastic valves. We discovered that they were all one piece molded, so if you got sand in them, you couldn't take them apart and clean them out.

So I looked them up in the catalogue, and discovered they were saving two cents per valve buying this model, in contrast to the ones we specified that you could take apart and reassemble. So I had a fight with the guys, I said, "We've got to replace all these things. You're going to have to buy these new items that cost two cents more a valve." Oh, that was quite a fight.

One of the things that was wanted around there--I didn't want one personally--but we had ordered two stopwatches. You use those in all kinds of applications, timing experiments and things. My god, I got a call, "What do you want stopwatches for out there?" I thought about it for a minute, and said, "Well, we're setting up a staff track team here, and we need stopwatches to time the races." He said, "Oh, that's all right." [laughter] That's the way those things went.

Lage: Who oversaw the budget like that? Somebody back at Corvallis. Was it Burt?

Hedgpeth: No, he didn't have much to do with the budget. That was the budget office.

Lage: Of the university?

Hedgpeth: Yes. My crowning touch with them was when a whole bunch of us went up to visit a Russian research vessel that was docked in Vancouver, British Columbia. We were granted authority to use a state car. And of course, an Oregon State credit card doesn't work in British Columbia, so I had to buy a tank of gasoline. Someone from the business office called me up and said, "You've paid more than the permissible on this gasoline. We're going to have to dock you about ninety-eight cents." I said, "Hey, don't you realize in Canada they have imperial gallons? That's about a half-pint more. I got a bargain for you, and you owe some more money." Well, he said, "Oh, the hell with it, then." That was too much, even for him. [laughs] Those miserable sorts of things went on.

The real bad stuff was this business of having everybody act as if you were out to do them in or competing with them. I was never asked to attend a Ph.D. exam or to be a member of a thesis committee. That simply isn't the way a university is supposed to operate. So I never could get enough cooperation on the National Science Foundation grant; I think it was more than two years, and I gave it up.

Lage: With this teacher training?

Hedgpeth: Yes.

Lage: You couldn't make that go.

Hedgpeth: Yes. We'd had quite a record in California, you know. One of our veterans is David Mertes, who is running the whole junior college system now. So anyway, the only people I really got along with there were in entomology.

Lage: In the Department of Entomology?

Hedgpeth: Yes. Of course, you realize that Oregon State originally was an agricultural school, so they're pretty strong in entomology. Several of the people had gone to school at Berkeley, and either knew me or we knew the same people. A fellow named Lattin was one of Professor Robert Usinger's students at Berkeley. He was on my Ph.D. qualifying exam committee.

Lage: How did you cooperate with them?

Hedgpeth: Oh, I didn't have to. We cooperated. I think Ray Thiess was one of the guys, he said he wanted to work on the study of intertidal insects. So the prof on the campus agreed to help him out. Of course, he didn't see any reason to go to the marine station; that's all right, too.

Lage: Were there places for them to live if they came out, or to stay? They didn't have to make that commute daily, hopefully?

Hedgpeth: Oh, no, we supplied their living, too, you see. We had a dormitory of sorts, and then some of them came with their families. It was up to them. But we supported them to some extent on that thing. Anyway, obviously, they couldn't get very far with the money involved. Also there were an awful lot of bad projects nationally. We were one of the few good ones in the country that really produced any results. It produced several Ph.D.s, and one of them went on to medicine. A couple of them went up in the U.S. National Museum; they did anything they could to get out of high school teaching. [laughs] Which I'm not sure I blame, especially the junior college. It's a little demeaning to have to fill out your curriculum down to the dot, practically have your lectures approved by somebody.

In fact, later when I was teaching at San Mateo junior college, because we had an all-day field trip, I canceled one of the evening lectures, and everybody agreed to that, except the pencil-pusher in the department said, "We'll have to dock you sixty dollars because you didn't hold an evening course as specified." I said, "What we did was--" because this was about the natural history of San Francisco Bay and we were in San Mateo, we went down to Coyote Point, looked it over, and talked about things. That was before the big museum was built there. Then we went over across the bay and looked at the Coyote Hills, which is a different matter, you know. Indian mounds and diggings and all that stuff. Then we went to Stockton, and came down by chartered boat all the way from Stockton to Coyote Point, so they could get back in their cars. With Karl Kortum narrating about every big old hull stuck in the mud and its history that he knew about. He knew them all.

Lage: That must have been a fascinating trip.

Hedgpeth: Oh, it was very nice, everybody enjoyed it, and I think they got a lot out of it.

Lage: And it was a long day.

Hedgpeth: Yes, it was a long day. It was about eight o'clock in the evening before we got back down there. Even in a reasonably fast boat. But that's the way the junior college operates--by the book--strictly by hours in the classroom.

Working with Bill Fry at Dillon Beach on Pycnogonid Research

Hedgpeth: When I was still at Dillon Beach, along came this student from England who wanted to study my favorite animals with me. He came with very high recommendations from one of the best biology profs in the United Kingdom at that time, and that was Carl Pantin, who was at Cambridge. So that's when Bill Fry appeared.

Lage: Bill Fry from England?

Hedgpeth: Yes.

Lage: And he studied sea spiders.

Hedgpeth: Yes, right.

Lage: Did he come on a grant from England, or just arrive?

Hedgpeth: Well, the college [of the Pacific] had given me a little money on the side for this kind of thing, for summer staff or--because they wanted to operate the station year-round--they gave me an assistantship for a year, which was more than Oregon State did. We had an assistant prof, but he was on their faculty list, primarily expected to teach over at the campus too. So anyway, Bill was hired simply as a research assistant. He only planned to spend a year, and he wound up spending two years.

One of his kids was born in Sebastopol. I'm his godfather; I haven't seen him now for several years. Since he had dual citizenship, he thought he'd come over here and get in the restaurant business. Found before he could get anywhere he'd have to take a course in a subject matter he already knew something about, and then get a union ticket. So he went back, and he owns his own pub now over near Cambridge somewhere. So I haven't heard much from him anymore.

Lage: That's your godson?

Hedgpeth: Yes.

Lage: What did you and Bill Fry do together on sea spiders?

Hedgpeth: Just went right to work with him. I had this tremendous collection, the Antarctic, they kept sending me--

Lage: Oh, I see. It wasn't necessarily things that you explored and discovered right there?

Hedgpeth: No, no. This is a major job. It went on and on and on, and finally wound up his share of the monograph. He and I did that one jointly.

Lage: What's it like to work jointly with somebody on preparing a monograph?

Hedgpeth: Oh, well, you just help out with the descriptions, and maybe you work one group or phase of the study. It was collaborate, criss-cross back and forth.

Lage: Is it easier to do with some people than with others?

Hedgpeth: Oh, naturally. A lot of things are easier to do with some people than others, depending on what they are. Everything from marriage to working in the shop, you know.

Lage: Well, was Bill Fry an easy man to work with?

Hedgpeth: Yes, he was. [In fact, Bill began to show skill in organizing people and getting things done. After stints at the British Museum (Natural History) and the marine laboratory at Menai Bridge, he took a teaching post at Luton College of Technology, and started the college on its way to its present status as Luton University. He managed to have me serve as an external examiner for Luton's first doctor's oral (viva) as part of my 1967 trip abroad. The candidate did well. Bill was also an efficient organizer of meetings and saw that the proceedings were published. First this resulted in a book about sponges (which he had begun to study during his time at the British Museum)--the copy he sent to me was inscribed "With clear memory of the fact that many good things began at Dillon Beach."]

He arranged, as a tribute to me, a symposium in 1976 at the Linnean Society of London on Pycnogonids that was published in 1978. In that year Bill and his wife were awarded a research grant of 21,000 pounds to study sea spiders. Bill was obviously headed for greater things and would probably have become a Fellow of the Royal Society in due course. But he did not have that time. He suffered a massive heart attack while driving his car from a meeting at Brighton in October 1980 when he was barely forty-four years old. It has not been easy to accept his

loss; I often wish that he was still going on to the good things that "began at Dillon Beach."

Dillon Beach is also gone; nothing remains of Pacific Marine Station but the two large concrete slabs on which the buildings rested, now unoccupied and blank beneath the sky.]¹

Lage: So you were working on Antarctica materials?

Hedgpeth: Yes. And I sent him down to the Antarctic. That was kind of amusing. He got down to Christchurch, New Zealand. Well, first place, before that, you have to go through a navy physical examination down there in east Oakland at the navy hospital. It's a pretty rigorous exam. They arrange it so everything gets later and later. About three o'clock, they say, "You've got to get an EKG up at the top of that hill, you've got about ten minutes to make it." It was called Cardiac Hill. So you get up there in time to get your EKG through, and if you do not drop dead, they pass you, I guess. So I had to do that, too, one time or another.

Anyway, they found Bill had a British army disability pension. He had been tromped on in a soccer game and had a pinched nerve in his shoulder. I was ordered to get him examined by a neurologist to see if it was safe for him to go in the Antarctic with that disability. I think the pension was something like a shilling a week or something, more paperwork than it was worth.

I called a friend of mine, an old junior college classmate, I knew his specialty was neurology.

##

Hedgpeth: I said, "I've never pulled the old high school tie on you, have I?" He said, "No, but you're about to." I said, "Yes, well, this is ordered by the National Science Foundation, and you just bill them for this. It's their request; they want this fellow to be examined within twenty-four hours so it won't interfere with the Antarctic schedule." He said, "Well, I guess I could get him in tomorrow." So he looked Bill over and said, "Well, you're all right. About forty years from now, that neck will start to bother you."

¹Mr. Hedgpeth added the preceding bracketed material during his review of the draft transcript.

Unfortunately, Bill died at forty-four. He said his father died young, too, so he had chosen the wrong genotype. But we got along very well.

The British system in their museums is to just put you in a vacancy and then expect you to become competent in it. I think this is how they got by with the Piltdown fake. The person who was most influential in being taken in hook, line, and sinker had no basic training in that kind of thing, in looking at fossils and sizing up stuff. Somebody--

Lage: So they just put you in an area that may or may not be your specialty?

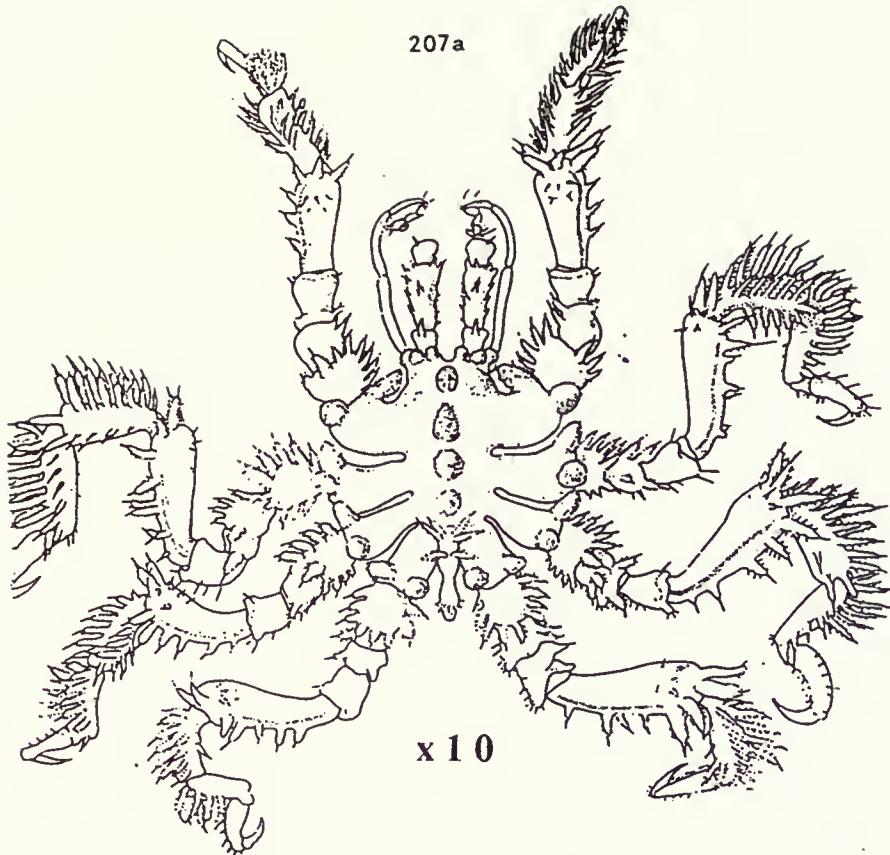
Hedgpeth: Yes. If they had a round hole and you were a square peg, why, that's too bad, you've got to fit in, old chappie. Another friend of mine who's a specialist in polychaete worms was asked to work on mollusks. First thing he did was throw out all the surplus mollusks that he didn't like, including some types. People were madly retrieving them out of his wastebasket. Finally, he had to leave. He wound up as director in charge of the Scottish National Museum in Edinburgh, and surprising to everybody, he worked very well at it. This was of course a general cultural museum. I visited him there when I was in Edinburgh, but that's another story.

A Research Program in Antarctica

Hedgpeth: So we built up this Antarctic program, and then I went down to McMurdo myself a couple of years later, which turned out to be a lovely way to absent myself for some time from the trials of Oregon State. At least they got the overhead on the things, you know.

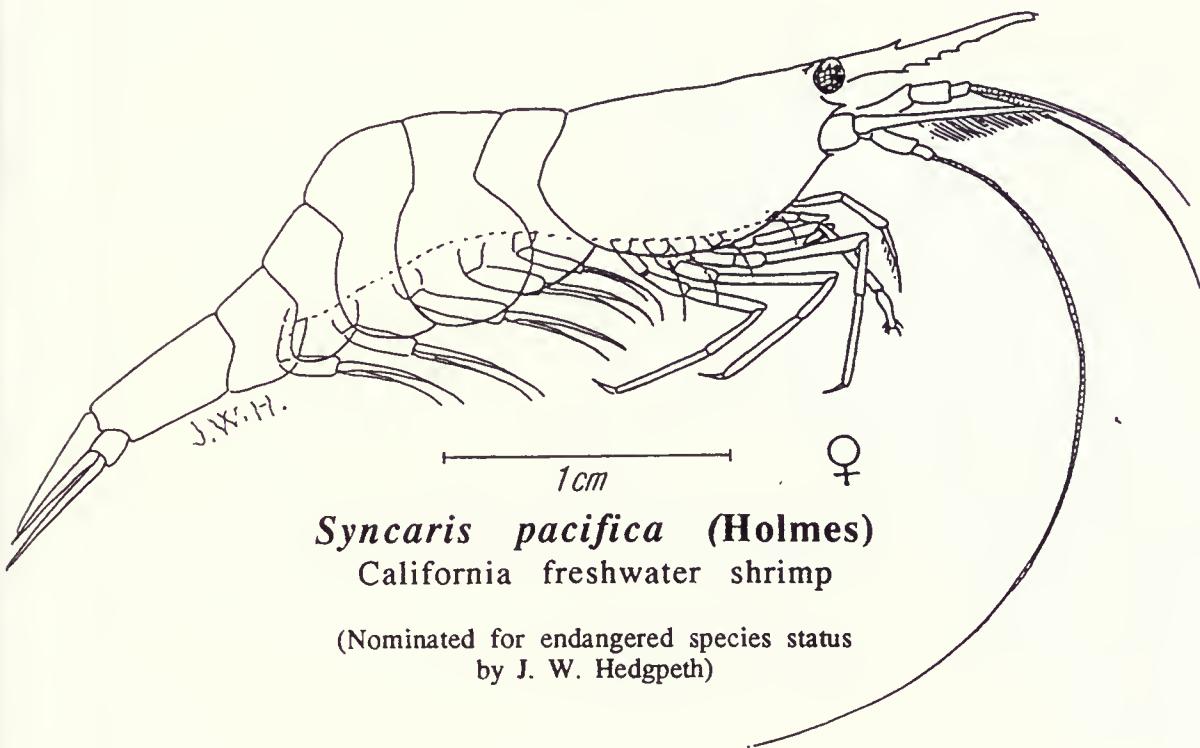
Lage: How many trips did you make there all together? It looks like you went also before you went to Oregon, a couple of times.

Hedgpeth: No, Bill went before. I think there were two trips that I took to McMurdo, and then to Palmer Station--I guess I have to get the dates of those things out, I don't remember them exactly [1957, 1959-60, 1974].



Nymphopsis spinosissima (Hall)

A spiny Pacific Coast pycnogonid
Drawing (from Oregon) by Lynn Rudy

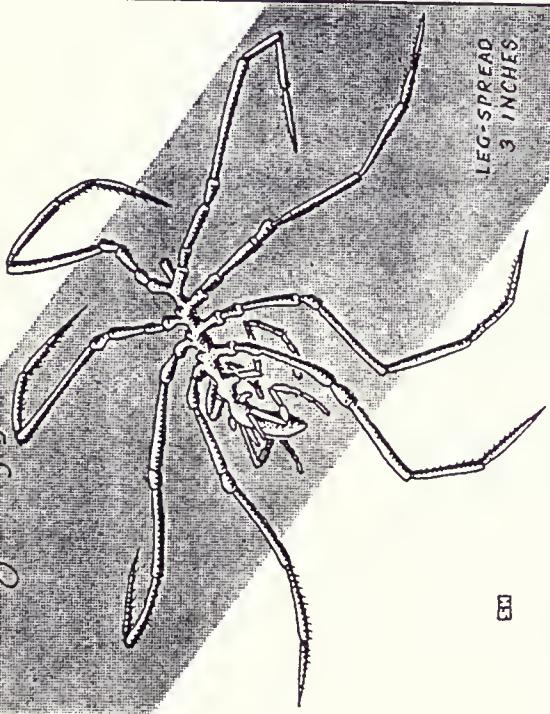


Syncaris pacifica (Holmes)
California freshwater shrimp

(Nominated for endangered species status
by J. W. Hedgpeth)

A SEA-SPIDER

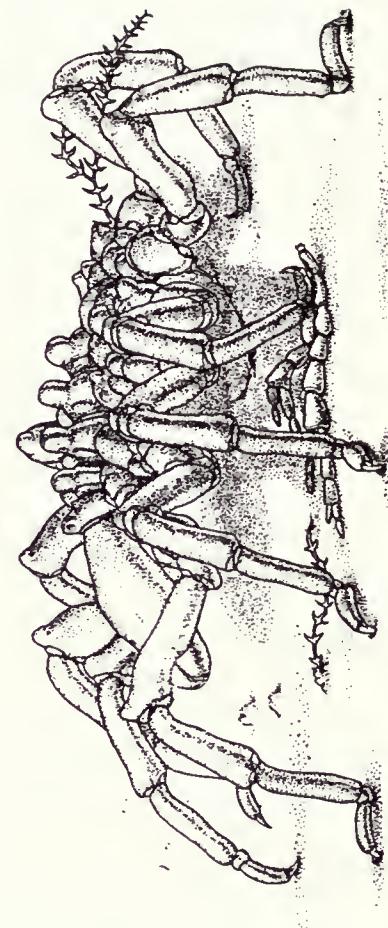
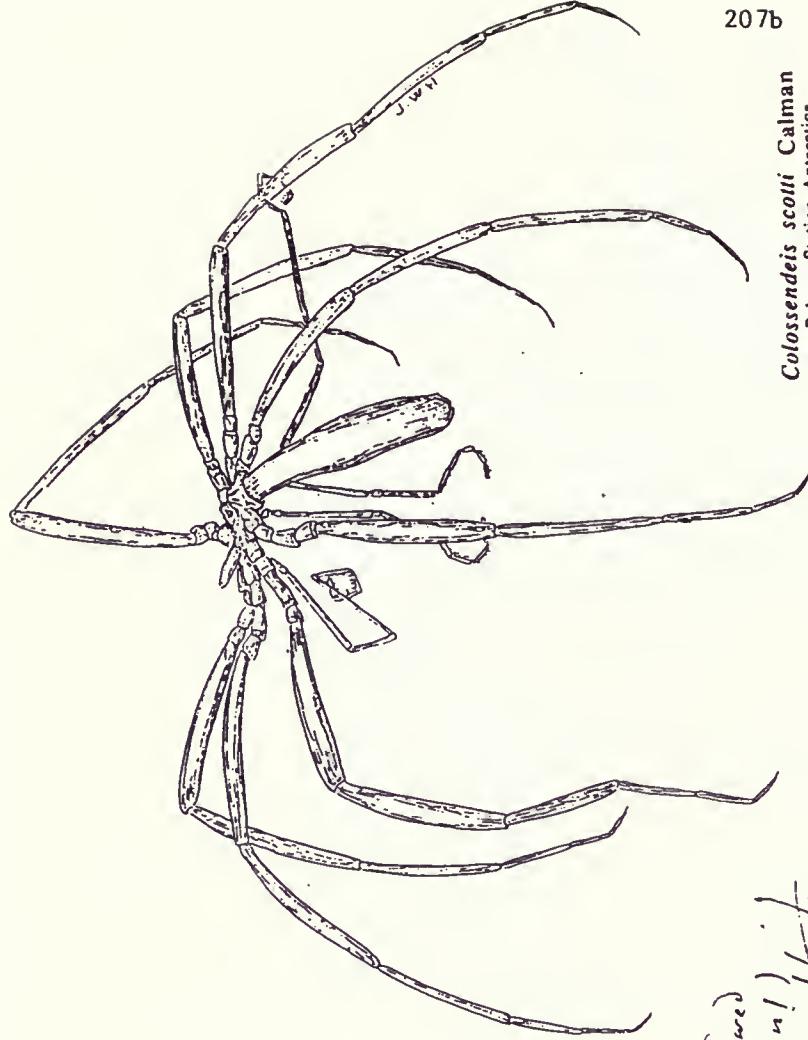
Ascorhynchus japonicus



This drawing by Sam Hinton was made from the specimen collected near Japan at a depth of 710 fathoms. (See p. 120a).

For Joel (who showed
me this specimen!)
Sam Hinton

207b
Colosendeis scotti Calman
nr Palmer Station Antarctica
ca $\frac{1}{2}$ nat. size



Al Child's masterpiece: portrait of the robust Antarctic *Pentapyxmon bouvieri*.
In the final installment of the report on the species of Antarctic
Pycnogniids (Volume 69 of Biology of Antarctic Series, 1995)

Some Interesting Characteristics of Sea Spiders

Hedgpeth: What we wanted to do, because these animals are very abundant in the Antarctic and some of the stranger phenomena about them occur in the Antarctic, and we can't decide yet whether this is some abnormal growth phenomenon or whether it's related to reduplicated chromosomes. So we--

Lage: If it's reduplicated chromosomes, what would that imply?

Hedgpeth: It would be very interesting, what it would imply, other than it wasn't any immediate environmental effect. But we found that there are too many chromosomes, like the famous whitefish, which used to appear on slides for everybody to look at, the set of twenty-five slides you've got for some zoology courses. They always gave you chromosomes of the whitefish, which had never been counted because they were so small and numerous, nobody could figure out how many. They may by now, of course, got it all. Not that that's an essential thing to know, but it's a nice thing to know.

So we also did observations on the biology of the animals. You see, the phenomenon that's so interesting is that most of these animals have only eight legs, four pairs. Some of them have five pair, and that makes ten legs. And several of them have six pairs. They look like a big circular centipede.

Lage: Are these ones found in the Antarctic?

Hedgpeth: They are there, yes. That twelve-legged guy is about eighteen inches across when fully developed; he's a monstrous thing, considering a lot of intertidal things we've got are about a quarter-inch long or less. These animals have absolutely no significance in the scheme of things that we can possibly think of. Lately, a charming gentleman I've known for many years named Henner (a familiar name for Heinrich) Fahrenbach who's an ultramicroscope operator for the Oregon Primate Center... I don't know just what exactly they do there with him, except they now retired him and told him he can use the equipment. Instead of a salary he does clinical work for the medical profession. He seems to be about the only one around who knows how to operate the apparatus.

He's taken up the pycnogonids to find out what their structure is like, and right bang off the bat he's found out some of their fine structure is like no other arthropods on earth.

Lage: So they become an even more interesting animal.

Hedgpeth: Yes. They're more closely related to a horseshoe crab than they are anything else, which is a surprise, but they don't have all the fancy appendages that those animals have.

Lage: Did you say that you found that it was a genetic difference, not an environmental difference?

Hedgpeth: We haven't found out. We still don't know.

The other strange thing about one of the main groups of these animals, including Dodecolopoda, that's one of the great twelve-legged monsters, is that we have no indication of how they grow, how they reproduce. In most of these animals, the male gathers the eggs as the female extrudes them, with a cement-like secretion from special glands and works them into a ball and carries them around until they hatch.

Lage: Even these little tiny ones that you're describing?

Hedgpeth: Yes, the shore ones. But these extra-legged giants, which are mostly deeper-water things--well, deeper water from 100 fathoms on, some of them are found in shallower water than that--we've never caught them with an egg mass, and we've never caught a larval stage. They have a very characteristic larval stage. So we don't know what's going on. The eggs must be very small, because the sexual apertures are not very large. So possibly, they are parasites of some other animal, we don't know what.

Lage: That the egg would become a parasite on another animal?

Hedgpeth: Yes. It wouldn't be on the parent, of course.

Lage: How do you go about exploring a question like that?

Hedgpeth: Well, that's it. We have specimens, hundreds of thousands of them now, I guess, all over the world, about which we have almost no information. They're just there, and we just give them a name.

Lage: But you don't know how they live, and reproduce.

Hedgpeth: Well, we know something about how quite a few of them live. We know that one of them does get around probably on jellyfish, as a larval stage. It's found in Japan and on this side of the water, too. But the others are deep-sea fellows.

So anyway, I went down to McMurdo the first time and then Palmer Station, where I had a charming voyage on the *Hero*.

Lage: What's the *Hero*?

Hedgpeth: The *Hero* was a research vessel built by the National Science Foundation, according to the whims of one of the big shots in NSF. What it is, is a downeast side trawler, and it works the nets off the side of the ship instead of over the stern. The most famous comment on it was by Athelstan Spilhaus who was credited with starting Sea Grant, who said to the officials of NSF, "You've gone and built an antique."

Well, it wasn't exactly suitable for research very well. In the first place, the model of the pattern of the ship was a coastal vessel, not for going out very far. So you had a big heavy winch somewhere about where the wheel house was, and running a live cable up forward and then going overboard there on pulleys and so forth. She had quite a sloping deck. So from the wheel house as originally designed, you couldn't see ahead where you were going. So if you're going to go sailing with a vessel like this in the Antarctic, where it's full of brash ice, broken hunks of ice the size of pianos, you know, sometime or another if you hit one of these, it's enough to bash you in.

Lage: It's nice to know where you're going.

Hedgpeth: Yes. Well, they had to build the wheel house up a notch so they could see over it. So they had a laboratory, one of them was up in the fo'c'sle area, and the slope was such that if you put water in the sink, why, the water would be sloshing off the back, and the fore edge would be down at the bottom of the sink. You could only use half the sink. So the only thing that it was good for was for skinning and stuffing birds, which you don't need the water for. So the ornithologist was happy with that place, but--

Lage: But not the marine biologist?

Hedgpeth: Well, you know, the darn thing was designed so that every bunk was slightly different in shape and location, so all the sheeting and so forth had to be specially tailored. If things didn't fit right, you were out of luck. They weren't comfortable for Antarctic duty. You couldn't open the hatches and let things air out or anything.

Finally, they took it out of service. She's now on the Oregon coast, actually, Florence, Oregon, I think. One of those coastal towns, where they want to use her for an offshore

excursion boat. Well, Oregon is a rough water part of the world, too, and you've got to get in and out of those little ports usually between two big breakwaters. You're lucky when the storm is coming in to get in and out of those places. You usually stay ashore.

And so she rolls and pitches, and I don't think it's any good for anybody who has any slight tendency towards seasickness.

Lage: May not work in Oregon; is this what we're--?

Hedgpeth: No, last I heard, she was up on blocks somewhere to be admired. Of course, that is not quite as ignominious as Errol Flynn's Zaca. He bought the Zaca from I don't know who owned it, and was taking his dad, who was actually a pycnogonid authority, of all crazy things, to sea. I never met Father Flynn.

Lage: Errol Flynn's father was a pycnogonid authority?

Hedgpeth: Yes, he was a zoologist. He was at Queens University. So Errol was going to take dear old Dad on an exploring trip to the Gulf of California, and it was quite a fiasco, I gather. It got written up several times. Several people jumped ship. One of the biologists had to extract a--I don't know whether it was a hook or the spine of some kind of shark, some of them have vicious big dorsal spines that are barbed. Stingrays do, too. Sort of had to operate on him, pitching deck and all, to save him. Apparently did.

Lage: When did that happen?

Hedgpeth: That was about 1941, was it?

Lage: So was that something you've heard about from people who were there, or you read about it?

Hedgpeth: Oh, it was written up all the time as a matter of fact.

Lage: Because of Errol Flynn, I'm sure. Not because of his father.

Hedgpeth: Yes. He had his girlfriend along, which--he was quite a character. His language was something that can't be repeated in the presence of a lady. At any rate, old Hubbs liked to tell the story about how he went along on the thing, cleaning fish to preserve them, gutting them and that sort of stuff. And a whole lot of slop on the deck, and he brought up a bucket of water from overboard, and swished it. About that time, the ship rolled a bit, and all this stuff went sloshing down the side and

into the port hole of the cabin occupied by Errol Flynn's light of love.

Errol Flynn came hopping up the ladder, stark naked, dripping, and said something like, "Who the goddamn hell," et cetera, "swabbing the deck in the bloody evening like this," and all that. And then he said, "Oh, it's you, Professor," turned around and went back. [laughter] Anyhow, it was all pretty wild, and half the crew quit. So the Zaca wound up tied to a pier in southern France, in the Riviera somewhere. It just sank last year, finally rotted the hull out and sank. Nobody would work on it, because they felt it was haunted by all the evil people that had been with Errol doing god knows what any Republican can think of. [laughs]

Lage: And would probably enjoy thinking of it.

Hedgpeth: Yes.

Lage: Now, let's see. I want to get you back to Antarctica.

Hedgpeth: Yes, right. Well, these were strictly study cruises, which were pretty nice.

Lage: Did you spend your time on ship?

Hedgpeth: Well, no.

Lage: Were you collecting?

Hedgpeth: Yes, we were collecting. No, I didn't go on any cruises; they don't run ships in the summer out of McMurdo very much, and none at all in the winter. There a lot of the collecting is done by diving. They bring things up all the time. They've been actively diving the Antarctic now for heaven knows, twenty-five, thirty years. We flew to McMurdo from Christchurch, New Zealand, and by ship to Palmer Station from Punta Arenas, Chile.

Lage: Did you do any diving?

Hedgpeth: No, I can't dive. Lose what's left of my hearing. Only got good hearing in one ear anyhow. I just wasn't meant for a diver's life. Paul Dayton who was down at Scripps is one of the experts on that. At Palmer, it wasn't so deep, and not much diving was carried on there. We went around by ship collecting and dragging a bit, so forth. We got enough there to raise in tanks, and we watched them and photographed their motion. Here you've got an animal with about twelve legs, circular, you want

to figure out how--whether it's developed a rhythm or not, to keep from tangling itself up.

Lage: So how it locomotes?

Hedgpeth: Yes. So we did a paper on that, that's in that fest book thing, the Festbuch that was arranged by Bill Fry.

Lage: What did you discover about how they move?

Hedgpeth: Well, we discovered they did have an advantage to get what was known as a metachronal rhythm, that is, working in sort of a sequence. Famous jingle which I can't remember about the centipede, when asked how it managed to walk, as soon as it started to try to think about that, he got hopelessly tangled up. [laughter]

Tourists at Palmer Station

Hedgpeth: We had an amusing scene down there at Palmer Station, which is on the Antarctic Peninsula, when we were visited by the first Lindblad tour. This was before they had a fancy ship, and they had chartered some old bucket of bolts from Chile or Argentina, looked like it belonged up on a ship dock somewhere. It had a very high freeboard, and so they had these--I think the median age of the people there was seventy or so.

Lage: These were just tourists?

Hedgpeth: Yes. I think one of them was about fifteen, I think had been sent down for his bar mitzvah or something as a present. Anyway, he stuck out like a sore thumb. Roger Tory Peterson was the naturalist telling them one penguin from another. They got caught on a rocky island in the harbor. In the Antarctic, every once in a while a storm suddenly comes up, whoosh, like that, and then goes. You've got less than twenty-four hours notice.

They had all the people out on these little low, rocky islands in the harbor, not very far away. They knew they couldn't get them back with that Jacob's ladder, after the storm began to hit, they would have to climb about thirty feet up the sheer side of the ship. Fortunately, we had a big icebreaker in the bay that had a couple of LCIs aboard, landing craft infantry types that go plop down on front so you can walk ashore. They got the passengers all off, and they had to put them up in our

dining hall overnight because they couldn't get back to the ship.

So to entertain them, the purser dug up--I think they issue--this is run by the navy--about 400 films to last a year. They're all in the charge of the quartermaster, sort of naval equivalent of a top sergeant, in some ways more officious and overbearing. So he was showing this film, it was supposed to be a humorous film set in the Colonies during the Revolution. Only it was filmed in England.

I sat there sort of bored. Roger Peterson was there beside me scraping his feet and saying, "Oh, dear, tut, tut, tut," and so forth. Finally, I said, "What's the matter?" He said, "Well, this is supposed to be in Massachusetts, but they haven't screened out the English bird calls." [laughter] I said, "I hadn't even noticed." So I went clear down to the bottom of Roger's opinion as an ornithologist, not that I had one anyway.

Lage: So that was what he noticed about the film?

Hedgpeth: Yes, that's what he noticed about it. [laughs] The rest of us just thought it was a bit dull.

I think one night the quartermaster had a real time for us. They gave us "Bonnie and Clyde," and what was the other one? Oh yes, the "St. Valentine's Day Massacre" as a double bill. And it wasn't Halloween.

Lage: How long was this ship stranded there with you, these tourists?

Hedgpeth: Well, just for twenty-four hours. The next day they could get back aboard. These storms just last that long, sometimes less. But they all thought it was very jolly. But anyway, in the morning--see, we got these requests, and the stamp collectors journals get this information from the National Science Foundation of all the personnel going to the Antarctic. So we would get letters from people we never knew about or anything, because they stamped a letter, they got the right stamp, of course, had to be U.S., asking us if we'd please send it back with the station cachet on it.

Well, the quartermaster, CPO, whatever he is, chief petty officer, he wouldn't let us use this station cachet. So while the purser from the ship...

Lage: This is like a postmark?

Hedgpeth: Yes. While the purser was stamping a great heap of envelopes, or covers, you know, with the little thing he had that said, "Commemorating the first Lindblad expedition to Antarctica," or something like that, I had collected a whole--we had bought some beer in Punta Arenas, and they had rather nice labels, a penguin dancing on the South Pole and the message, "La ceverceria mas austral del mundo." So we soaked the labels off the bottles--I don't know why, just to be doing something--and I was pasting these labels on some of the envelopes. The purser said, "What are you doing?" He had been allowed to use the station cachet, so I had borrowed it from him. I said, "Well, I think these are going to be a lot rarer than yours, because I have a rather limited number of these beer labels." He grabbed back the cachet stamp and folded up his wares and went off somewhere. [laughs] So I wouldn't be encroaching on his domain, I guess.

Funny deal about that was, I got a letter from a kid in Germany. At that time, I hadn't access to the cachets, so I wrote a little note to him and I said, "I'm sending you a very special one; due to the limited number of labels, it's going to be a lot rarer than a cachet which our CPO wouldn't let us use." It's the only time I ever got a response on these things. He wrote a nice thank-you letter. Usually you don't get anything. In fact, when some Australian stamp club sent us a box of 250 of these things to be returned, by command of Washington, the guy in charge just threw them all away. Didn't want to get mixed up in that much of the business. In fact, I think they try to keep the stamp clubs from learning about who's there--

Lage: Yes, this sounds like a big enterprise. You could spend all your time returning mail.

Hedgpeth: Oh, sure, could if you would.

Lage: So the Germany boy appreciated the beer labels?

Hedgpeth: Yes, he wrote a nice letter to me. [laughs] Another time I was traveling in Germany. I went to Frankfurt and to Nuremberg. First place, I wanted to see Albert Dürer's house. Second, I wanted to see the German railroad museum, which is a very fine one. Trains began in Germany at Nuremberg. So they have this lovely big model set up, and a whole locomotive cut in half, and all this kind of stuff. I had gone there, about an hour's run from Frankfurt to Nuremberg on a Eurail pass. Wasn't very many people in the train, so I settled down in the second-class compartment, and got a lecture from the conductor. The Eurail ticket was a first-class ticket, and I should be seated in the first-class compartment.

I told him I didn't know what real reason for that was, since I was quite happy here, nobody else was here in the compartment. He gave up on me after a while, first place I guess because my German wasn't fluent enough to keep up with him. But he kept--even when we got to the station, he looked at me and shook his head as I got off the train.

So on the way back, I got in, I didn't even notice what compartment it was. A boy there about seventeen or eighteen--he was a real addict. He had the complete timetables of the entire German system, and he was ticking off the times as they went to the stations, checking up to see whether this train was running properly or not. Then apparently, he'd also been to the museum, though I hadn't seen him there. He had bought a very nice model locomotive, and I asked to look at it. Well, we both looked at it.

So along comes another conductor and starts to work me over about sitting in the wrong compartment. This kid chimes up that I was a very dear friend of his, and also a well-known railroader type, and all this kind of rubbish, and talked the guy right out into the passageway and slammed the door on him. [laughter] I never even learned the kid's name.

Lage: That shows a little lack of respect for authority.

Hedgpeth: Yes, well, I guess conductors are fair game. We got off the subject.

Studying the Impact of Scientific Activity on the Antarctic Environment

Lage: More on Antarctica.

Hedgpeth: Yes, the last time I was in Antarctica was--. Well, George Llano cooked this up, I think for a certain deliberate purpose. He knew what kind of--

Lage: Now, George Llano, who was he?

Hedgpeth: He was in charge of Antarctic biology, and that is a division of the National Science Foundation under Polar Programs. Anyway, he suggested I be sent down there to prepare a report on the influence of scientific activity in Antarctica.

Lage: Was it something you had commented on to him, or how did he happen to pick you?

Hedgpeth: Well, I know he just knew my temperament and about this kind of thing, I guess. So they gave me a contract to go down there--

Lage: And that was November '74.

Hedgpeth: Yes. At that time, they had just decommissioned the--they had a little atomic power plant there, old kind of little one-lung deal.

Lage: To develop power for the station?

Hedgpeth: Yes. And it was halfway up Observatory Hill. Observatory Hill is a little cinder cone right--

Lage: Is that at McMurdo?

Hedgpeth: Yes, McMurdo. It had started to leak or something, so they decided they couldn't be running it any more.

##

Hedgpeth: So they were starting to take it apart. But among other things, you don't have as much heat as you have in an atomic power plant, so they were distilling water. The distilled water was to service the base, which in summer had a population of about 2,500 people, a lot of navy personnel and all kinds of hangers-on. I noticed that it had a chlorination unit on it. I said, "What do you need that for?" "Well, we don't need it, but it's requirements that all water served to personnel in the navy must be chlorinated." "Even when it's distilled?" "Oh, yes, of course." [laughter] So that was that part of it.

Lage: What was McMurdo like?

Hedgpeth: Well, you see, it's very dangerous to have a big fire to burn trash there, because the wind would come up and take it out, and it's very dry, everything will burn. If you've got anything that could burn the whole base down, be careful. It was a mess, they had all kinds of wires, of course, and like these old pictures of New York in 1910 or so, there were solid masses of wires on posts and all of this, between here and there.

The ships landed main supplies right down near Scott's hut. This was his hut he used the trip before his last. It's not the one from which he started to the pole; that's a few miles away. But it's also one that he had over-wintered in. And of course,

it's an international monument, and to be treated most sacredly and all of that. But it was built there because it was right near the edge where you can bring a ship up in the summertime and unload and load and so forth.

So when the touring began, you can see real plainly what was going to happen. All these people get off there, and they'd be asked to walk up to the base, it's about a half a mile, right past the main trash dump. New Zealanders complained--of course, they're very neat. Everything is scrubbed up; well, they'd take all their junk over and dump it into our trash heap, which I'd called in my report the McMurdo Municipal Dump. That wasn't taken very kindly. There's a lot of old stuffed shirts in the Antarctic program anyway.

Lage: More so than in other programs?

Hedgpeth: Oh, yes.

Lage: Why is that?

Hedgpeth: [in British accent] Oh, you should read what the British think, about the story that Scott's crew were all a bunch of homos and all of this stuff. One of the more pompous Britishers says, "Polar men wouldn't do this sort of thing." [laughter]

Lage: Now, how did they react? I would think you wouldn't do too well with stuffed shirts.

Hedgpeth: No, just somehow the temptation of puncturing them is almost too big.

Lage: How did they react to you?

Hedgpeth: Well, they cashed me out. They decided that what I had done so far was about all they needed.

Lage: In terms of investigating the environmental damage?

Hedgpeth: Yes. They also sent me to the South Pole just to say I'd been there.

Lage: So you did go to the South Pole?

Hedgpeth: Well, I went down there by a C131 with about 8,000 gallons of fuel in a big tank. It was sort of the milk run; just turned around and came back about two hours later. So I walked around there. Of course, it was pretty hard to see anything there. You go under, the original base is sort of now under ice--can't

be underground, because it was about 5,000 feet of ice there down to bedrock. You can see where the pressure was beginning to squash things in, but they had just built this great palace of sort of a big dome, geodesic dome, lot of--what do you call those darn barrel-like buildings? They have a name for them, anyhow.

Then as I say, they decided they didn't need what I had written, and to pay me off, which they did. That's all right.

Lage: But you didn't really complete your study?

Hedgpeth: No, I hadn't. But then comes the cream of the jest. They proceed to hire some environmental impact outfit, which included one of the fellows I'd seen down in the Antarctic several times, and still see him around, Gordon Robilliard. He works for one of these consulting outfits now. He was Paul Dayton's diving mate in the early years.

So what do they do? They give him my rough draft to work with. [laughs] Got to where my friend Jerry Bertrand of the Massachusetts Audubon Society, a former student, was a little piqued by the whole thing, and just for the hell of it, he got it out of the files by the Freedom of Information Act--[laughs]

Lage: Got your report?

Hedgpeth: Yes. Well, substantial--a lot of what I had said--I just pointed out that one of the things that was not helping anything at all was this regular run that was from McMurdo to the South Pole, because the exhaust from the aircraft is creating a great swath of carbon pollution on the surface of the ice. One of the problems with that is it interfered with the projects that some people had to take the firn, which is just that very crisp ice at the top, and go straight down, so they could see that the onset of the Industrial Revolution was recorded, because of the increase in carbon. And this interfered with that kind of information. You have to count that whole swath between McMurdo and the South Pole as being useless for that purpose. Of course, they finally agreed with me, but--.

Lage: So even for their scientific purposes, they were--

Hedgpeth: Yes. Well, this was supposed to be, as I had said, one of the things we find out in the dry valley--the dry valley is a very interesting place there--

Lage: The what, dry valley?

Hedgpeth: Yes. They are a strange sort of oasis in the middle of nothing. There's no plant life there, except there's a puddle there called a lake in one of them. These are not far from McMurdo, they're only about forty minutes away by chopper. Walking around there, and all the rocks had been smoothed over and carved into strange shapes. They're called ventifacts, which most of the unlettered keep calling ventrifacts. Makes them more intestinal than windblown, but anyhow. [laughs] So they called it Ashtray Valley on that account, because of nice-shaped stones, and took them home, and there's hardly any of them left anymore. I pointed out there was indeed a surplus of plastic pen barrels being left all over the place, and you could walk around and see those. Although the aesthetic impact may be of no great value, they did indicate we'd been there somehow. Things like that.

The other thing was that other delightful way of getting rid of some of their undesirable material, like honey buckets, was just to put them on the edge of the ice, and when the ice broke up in the summer and headed north, they didn't know where or when these things would sink or what would happen to them afterwards. The crowning touch of that was when some ichthyologist somewhere in Nebraska or South Dakota had been studying fish, and he had pickled all his fish for further study and put them in a barrel. They got the wrong label on the wrong barrel, and so he was told that his fish were waiting for him down on the station platform, about 90 to 100 degrees in the sun. He opened up the barrel and found he'd been sent the honey bucket. He never knew what happened to his fish.

Lage: It sounds very sloppy, very poor care of the area.

Hedgpeth: Well, it was. These little details, I don't think they cared too much for.

Lage: Do you think it's improved at all since they--

Hedgpeth: I haven't been back there to check up on it. I don't think I will ever go back. I'm now overage for anything like that, especially with my record of operations. But when they dedicated the statue to Byrd at the McMurdo base, they invited at that time the only surviving member of Scott's team, Sir Charles Wright, who was a specialist on ice and polar physics and so forth. He was the man who spotted the tent in which Scott and Wilson had died.

So they took him down there to lend tone to the occasion, waived all age and physical requirements. This was a VIP to come down and go back on the next plane, that sort of stuff.

But anyway, the story is that one morning, some of the young fellows who happened to be seated at breakfast with him asked him what he was going to do today, and he said he was going to walk to the top of Observatory Hill. Well, this volcanic cone is about 300 feet high. It's not exactly an easy climb for any age.

One of the navy brass overheard him, and so he said, "Well, I think we'll have to send some fellows up along with you to be sure things go well." He grabbed two of the stoutest looking characters around, navy ratings, you know, didn't have anything to say about their future. So off they went.

They got halfway up the hill, and the young fellows started to pant and said, "We've got to take a breather." Sir Charles looked at them, and he had this most angelic expression on his face. He was at Scripps for a year or so, and we got to know him pretty well. He said, "What's the matter, didn't you fellows eat your Wheaties this morning?" [laughter] He wanted to go up to the top and see--they'd put a cross up in honor of Scott on the top of the hill, and he wanted to see what shape it was in. [laughs]

Lage: So did he go on ahead?

Hedgpeth: Yes, he went on ahead.

There's another thing there, I had visited the chaplain to find out what the thought was about these things, and he didn't think much about them. But anyway, he said he had his own disposal problem right now. Some professor for whom a hill had been named wanted his ashes scattered there, and the chaplain said, "Of course, it's rather ticklish, because we're not allowed to do that in this part of the world. Strictly forbidden, and all of that." So they had handed the whole matter over to the chaplain, and he had a stack of paper about this high he had to fill out for all this business.

What they finally did, he wouldn't want to commit. I suppose they did scatter them for him. The Russians actually buried several of their people who were killed in an accident. They had asked us to--there is a very nice pink granite down there, I think it's near Cape Hallet, but anyway, somebody spotted it and carved a lot of it off for samples. The Russians had seen this stuff, and they asked for a slab of it for a tombstone for this guy. We obliged them.

Lage: And they buried him down there?

Hedgpeth: Yes. Well, things happen in winter, you can't do anything about things until the next ship comes in maybe six months later.

Lage: That's true, I guess you have to do something. Now, when did you get the Antarctic Medal for contributions to Antarctic studies?

Hedgpeth: I don't know, it just came along in the mail written by somebody saying I was entitled to receive the Antarctic Medal. [1971]

Lage: Was that for your sea spider studies?

Hedgpeth: Well, I told some people I thought it was for putting up with George Llano for three trips down there. [laughs]

Hedgpeth Heights

Lage: Now, how about the Hedgpeth Heights? Was that for the same reason? Why Hedgpeth Heights was named after you. [See Appendix G for Hedgpeth placenames.]

Hedgpeth: Since the other adjacent one was Quam Heights and he was an official at NSF, I don't know just why they did that, but I think they have a lot of space in Antarctica, it's 5 million square miles.

Lage: They don't have to name everything, though.

Hedgpeth: Oh, the Board of Geographic Names thinks that way. An extraordinary stuffy lot.

Lage: Was the particular spot they named have anything to do with you?

Hedgpeth: No, it's just near Cape Adare. It's right on the main line, so I could fly right over it and see it. In fact, I was flying back in a New Zealand plane--they're much easier to get along with than our people, who had all kinds of regulations--so I pointed it out on the map, and the pilot said, "Oh, that's just over there, it's only about five minutes out of the way. We'll fly right over there for you."

Lage: So that was named fairly early, then, if you have flown over it.

Hedgpeth: No, that was the last time I was down there, in 1974.

Lage: Now, in the Sierra, I know they're always reluctant to name anything after somebody who's living, like a Sierra peak. But I guess they don't feel that way about Antarctica.

Hedgpeth: No. I had a tiff with the Board of Geographic Names. First place, they said they wouldn't use possessives any more. So they had written my grandmother's name as Nelly Cove; it's Nellie's Cove up there at Port Orford. It's where she used to collect agates. So I said that--wrote them a note saying, "At least I wish you'd spell her name right." She always spelled it Nellie.

Lage: And how did they spell it, with a Y?

Hedgpeth: Yes. And without the possessive. But they said they wouldn't put that back on it, because they don't believe in possessives. And along came this new map of the California coast in which they had taken the tilde off of Año Nuevo.

Lage: They don't believe in that either?

Hedgpeth: Yes. So I pointed out to them, I said, "Hey, that word is one of the few in which the failure to use a tilde really makes a difference."

Lage: What kind of a difference does it make?

Hedgpeth: I said, "What it means is that I would be unable to display the latest edition of your map in the hallway where it might be seen by the fine ladies of Spanish extraction."

Lage: You're going to have to explain that one for me.

Hedgpeth: All right. The tilde means year, año. That's the tilde, the curve. It's New Year's Point. It tells you almost exactly when Point Reyes was named, since Point Reyes stands for the epiphany in Spanish, Punta de los tres Reyes, which is the sixth of January. They were at New Year's Day at Año Nuevo. Now, without the tilde, it means ass, it's anus.

Lage: It makes a difference.

Hedgpeth: It does.

Lage: Did they change it?

Hedgpeth: They did. They wrote a letter and said, "Few people have made such a strong point as you, we're going to put the tilde back on in this case."

Lage: So you finally got a response to one of your letters.

Hedgpeth: Yes.

More on Oregon State University

Lage: Okay, now let's see if there's more to say about Oregon, and then we can move on to San Francisco Bay.

Hedgpeth: Yes. About Oregon is--a very funny episode did happen, not funny, but rather mean in some ways. There was a meeting in Portland on various subjects, and Oregon State had been asked to participate. Nobody wanted to go. So they asked me if I would be interested in doing that, and I said, "Well."

Lage: What was the meeting?

Hedgpeth: Well, I don't know what it was all about, mostly biological matters of estuaries and pollution and this kind of stuff. You see, it wasn't a really fancy trip. If it was, let's say to Melbourne or Sydney, Australia, why, you'd have been trampled to death trying to get on that one.

So anyway, I went up to Portland and gave kind of a little preliminary speech, and I was asked to write it up. So I wrote this paper up, and then it was passed around in the oceanography department, and everybody looked at it. I forgot all about that aspect of it. Suddenly, parts of it appeared in the proposal written by two of my colleagues. So I complained to the chairman, I said, "Look at this, some of this is almost the same phraseology as was used in my grant proposal to the Office of Naval Research."

Lage: So you'd already used some of it for--

Hedgpeth: Yes, and I said, "I have already used some of that in the grant proposal," which they had seen, the top brass had seen, I guess. The chairman had been assured that I had been told about it, and I said, "No, that's not the case. It might cause some embarrassment if these two proposals should wind up on the same desk, as is quite possible in this sort of thing." So we never resolved that matter. That was on Earth Day, so I had pretty much lost interest in getting along with these people.

Lage: So this is sort of another example of the competitive style.

Hedgpeth: Yes, right. Of course, they didn't get any grant.

Lage: Did you?

Hedgpeth: Well, yes, but the rest of their proposal was so silly that it wouldn't work.

Lage: Were you able to get enough grants to keep the station going?

Hedgpeth: Not as much as they were supposed to get. That would be impossible, really, without any cooperation from the--

Lage: Did you have much of a staff out there that you supervised?

Hedgpeth: No, I just had one usually.

Lage: And the maintenance--

Hedgpeth: Yes. Well, he disappeared. They had to send him home. He was directly under building and grounds from Corvallis.

Lage: So you were sort of left on your own to take the research where you wanted it to go, it sounds like?

Hedgpeth: Sure. So I took it to the Antarctic.

Lage: And that was the focus of what you did up there?

Hedgpeth: Yes. In the last several years.

Lage: So actually, the bay itself that you were situated on didn't define the program at all. It wasn't local research.

Hedgpeth: No. And I was never asked by anybody to participate in any of the programs they had.

Lage: What kind of program would that have been, on the campus?

Hedgpeth: Yes.

Lage: How did the fisheries side of the program go?

Hedgpeth: I don't know.

Lage: Wasn't too much communication there?

Hedgpeth: The guy in charge of it quit after a while, he had such problems with the committee on curriculum. I didn't have any problems; they had some problems with me. But [William J.] McNeil, the

fisheries guy, had recommended a textbook, because he had great trouble with those chaps over there in fisheries, because none of them knew any math and they didn't understand the mathematics of population changes and all this kind of stuff. He named his course after the very fine tome entitled *The Exploitation of Fishery Stocks*. I knew about the book myself, too. The curriculum committee objected to the term "exploitation" in the title for a course.

Lage: Sounds like a very stuffy bunch.

Hedgpeth: Then they built up something about problems with an ecology course because it impinged on the interests of entomologists and the physiologists, and there was some objection in this part or another, and they said, "The matter is adjourned, it will be taken up at the next meeting." The next meeting went on the same as the first, so I just patched up a memo with various assorted quotations from the works of C. L. Dodgson, which I submitted as being by C. L. Dodgson. [See following page.]

Next I heard of it was from a dean. He said, "Somebody came around and said they couldn't find that name [C. L. Dodgson] on the faculty list, and they wondered who he was. I told him to try the mathematics department." [laughs] Anyway, it was considered one of the best memoranda I ever wrote, and I didn't write a word of it, I just rearranged the two quotations from the successive meetings and this thing wound up finally where the Mad Hatter says, "Oh, look what time it is, gentlemen! It's time to adjourn, please go home." [laughter]

Lage: Did people appreciate that, or were they really kind of thrown by it?

Hedgpeth: Well, a couple of those people didn't even know what it was all about. They couldn't figure out what the memo was or why.

Lage: It sounds like it was a frustrating experience for you.

Hedgpeth: Considering I was raised with the story that my grandfather always read *Alice in Wonderland* before sticky days in court.

Lage: Do you think you take after your grandfather?

Hedgpeth: I suppose I do, I don't know. I had so many of these rather domineering aunts. One of them wrote to me in high school and said, "I understand you are writing for the school paper. Whatever you do, don't become another Ambrose Bierce." So I immediately dashed to the library and found out who Ambrose Bierce was. [laughs]

My best memo, and not an original word in it!

TO: Council on Curriculum and Academic Policy
 FROM: C. L. Dodgson
 SUBJECT: Words

THE RECORD:

Minutes, Meeting 7, October 10, 1968:

Use of the word "animal" in the proposed titles for Ent 475, Comparative Animal Behavior, and Mb 434, Animal Virology, were discussed briefly. It was decided that action should be deferred on these courses pending further discussions with the departments raising questions about the proposed changes.

Minutes, Meeting 9, October 17, 1968:

Proposed title of Ent 475, Comparative Animal Behavior, was further discussed, and response and communications were reviewed. . . concerning definitions, limits, overlaps, duplications, and further lines of developments, and procedures for interdisciplinary discussion and review in the areas of animal behavior. By a majority of one, it was voted that the title might be changed to "Animal Behavior" for the time being with the word "Comparative" deleted. . . persons interested in developments in this area should meet to discuss this matter and to reach agreement if possible.

DISCUSSION:

"When I use a word," Humpty Dumpty said in a rather scornful tone, "it means just what I choose it to mean - neither more nor less."

"What is the use of repeating all that stuff?" the Mock Turtle interrupted, "if you don't explain it as you go? It's by far the most confusing thing that I have ever heard!"

"Shall we try another figure of the Lobster Quadrille?" the Gryphon went on, "or would you like the Mock Turtle to sing you another song?"

CHAIRMAN:

"Is there a motion before the house?"

VOICE FROM THE FLOOR:

"No, no - sentence first, verdict afterwards! Off with his head!"

CHAIRMAN:

"Gentlemen, consider what a long way you've come today. Consider what o'clock it is. Consider anything, only don't cry. Just adjourn!"

Lage: She led you in the right direction.

Hedgpeth: I suppose.

Lage: I wonder if she thought you had the capability for becoming another Ambrose Bierce? She may have seen something in your character.

Hedgpeth: I don't know.

"Steinbeck and the Sea" Conference

Lage: Was it at Oregon that you met up with Richard Astro and got involved in the Steinbeck and the--

Hedgpeth: Oh, yes. Well, he had done a thesis on Steinbeck.

Lage: Was it on Steinbeck and Ricketts, or just Steinbeck?

Hedgpeth: Just Steinbeck. But--

Lage: Was he in the English department there?

Hedgpeth: Yes. He's now a provost or something at the new Florida State, central Florida, something in Orlando.

Lage: So he'd done a thesis on Steinbeck, and then how did you happen to meet him?

Hedgpeth: He looked me up.

Lage: Because he knew you'd known Ricketts?

Hedgpeth: Somebody had told him. I don't know how he got hold of--.

Lage: How did this idea of the "Steinbeck and the Sea" conference come about?

Hedgpeth: Well, he decided, since I could provide a lot of information and so forth, that we'd get together a conference. One thing led to another. Of course, there's money in the humanities for these kinds of things, so he got some funding for it.

Lage: And you held it out at the station?

Hedgpeth: Well, I held one session there at the station, but the main one was held in Corvallis. That's the one we got Joseph Campbell to attend, and a few other people. I don't know whether he knew at the time that Campbell had known Steinbeck and Ricketts or not. Certainly didn't know about the stuff this guy Larson, who wrote a biography of Joseph Campbell, dug up in the--.

Lage: What is that stuff?

Hedgpeth: Oh, the romance that Joe Campbell had with Mrs. Steinbeck, et cetera. Well, they decided they wouldn't carry it any further, and that was when Steinbeck said, "That's the worst thing you could do." [laughter] They understood what they were disagreeing, we'd not carry it on any further, before they realized they were, according to Larson, potential soul mates or something of the sort. Anyway.

Lage: Astro seemed to later develop quite a concentration on the influence of Ricketts on Steinbeck.

Hedgpeth: Yes. He wrote that other book on that.

Lage: Did that thinking come about through that conference?

Hedgpeth: Yes. It sort of revived this business, thanks to me. Well, I went down and talked to various people including Carol Steinbeck Brown.

Lage: You did that after the conference, or to prepare for it?

Hedgpeth: Well, I had to write up this stuff, because Astro's thesis depended on access to some of the stuff that Ricketts had written, and I had published that.

Lage: Had you already published *Outer Shores*?

Hedgpeth: No.

##

Lage: You put a lot of time in on studying Ricketts.

Hedgpeth: Yes. I dug up all his papers. One time I was in Tallahassee lecturing; I had a friend there who was on the faculty, Albert Collier. He drove me over to Gainesville, where I went through Lisca's stuff, which he's still got, and won't give to anybody.

Lage: Who is he? I know you've mentioned him, but I've forgotten.

Hedgpeth: Lisca is a professor of English at--I gather he's gone practically bonkers or something, had about five wives--I hope the crocodiles eat him up or something, alligators.

Lage: But not his papers. Does he have Ricketts' papers or Steinbeck's?

Hedgpeth: He has Ricketts' papers, a lot of them. He had a lot of correspondence, he had a lot of personal papers. See, Ricketts kept carbons of everything he wrote. There's a set there to his children they'd like to get.

Lage: How did Lisca get them?

Hedgpeth: He came down to Pacific Marine Station before this kind of thing really got going, borrowed them or something, was told he could have them I guess, I don't know what. I was not there, so I don't know.¹

I don't know what more you want to hear about goings-on in Oregon.

Lage: Is there any more you think that we should hear, or do you think we've gotten the idea?

Hedgpeth: I was the opening speaker on the first Earth Day there at Corvallis. Then I went over to Eugene and gave the afternoon talk.

Lage: Was that a big event in Oregon, Earth Day? This is 1970.

Hedgpeth: Well attended. Of course, I naturally wound up by quoting Thoreau, last line in Walden, "The earth is but a morning star," so forth. I think there's quite a few people at Oregon State who figure this is rather dangerous stuff.

Lage: Was it a pretty conservative community there?

Hedgpeth: [English accent] Oh, yes. Oh, yes. Especially at Corvallis.

Look at what's happening up in Oregon now, they've got a proposition on their ballot that will ban homosexuals.

¹Just lately (summer of 1994) all the Ricketts papers arrived at the Stanford University Library without advance notice or any explanation. We haven't learned what happened to Lisca; maybe the alligators did eat him.
--JWH.

Lage: Yes, I've read about that.

Hedgpeth: Consider it all part of original sin. That might be as genetic as anything else, if they thought about it seriously.

Lage: It looks like they're going to decide that before too long.

Hedgpeth: Well, it will be chaos if they do vote on that thing favorably.

Retirement

Lage: When you left Oregon, did you retire or did you--what happened?

Hedgpeth: Well, the president of the university announced that the budget was getting tight, and a compulsory retirement would be enforced--I don't know whether it was [age] sixty-seven or whatever funny year it was now, I forget--and that those who could possibly retire earlier than that could make the salaries available for the younger people who needed them, et cetera, et cetera, you know.

So I went around to the business office and I said, "Well, I've got three years to go, according to the president's memorandum. How much more pension will I have if I stick it out three years?" After a few minutes of fiddling with the buttons, the guy came back and said, "Oh, it would be about eight dollars a month." I said, "Oh, that ain't worth it, bye." [laughs]

Lage: Not much incentive to stick it out.

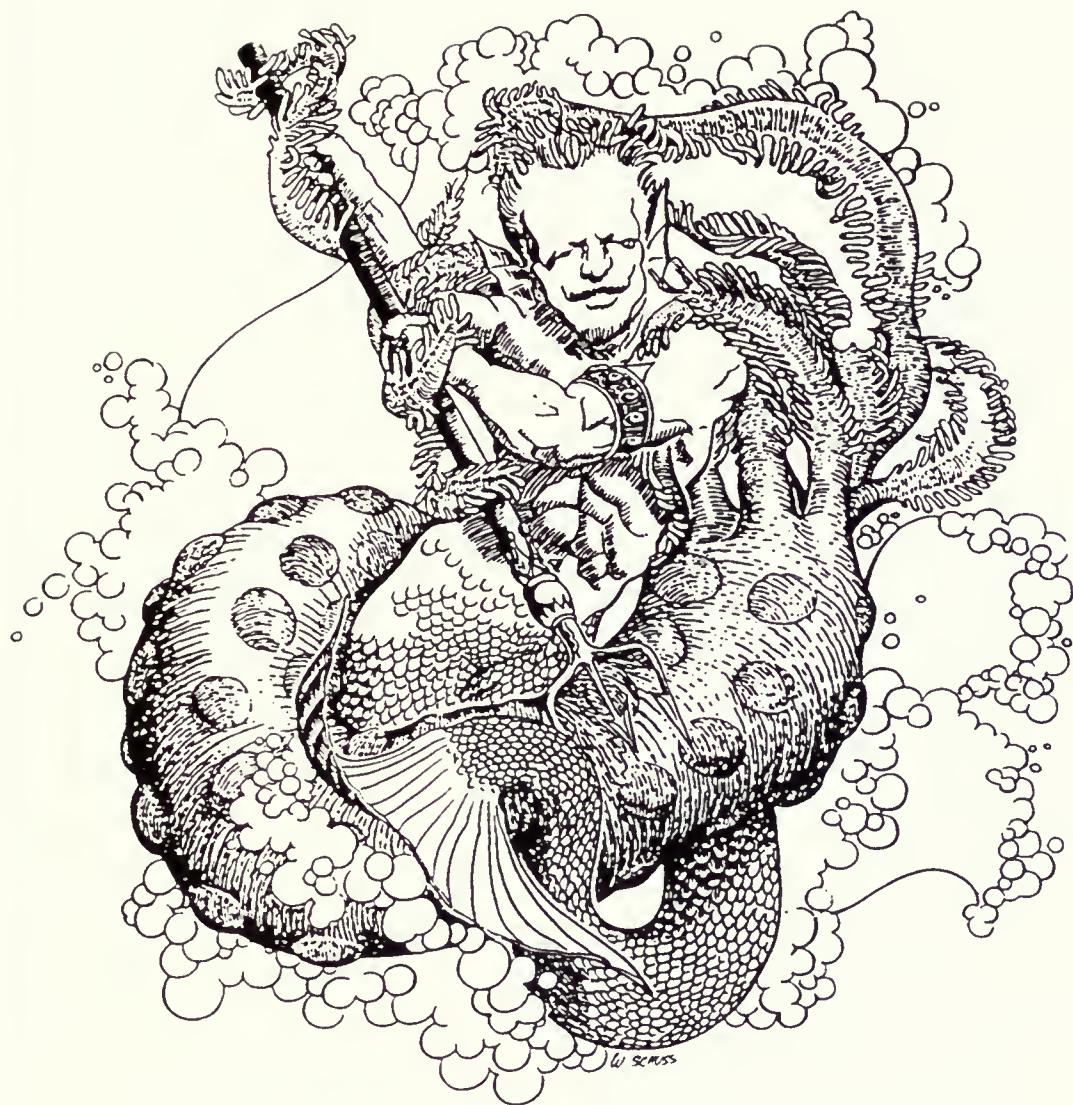
Hedgpeth: No.

Lage: So then you went into independent consulting?

Hedgpeth: Well, I guess so. Yes, I would be consulting and--.

Lage: How did you happen to move back here to Santa Rosa?

Hedgpeth: We'd lived at Sebastopol when I was working at Dillon Beach. Florence wanted to live in a town that was a little larger, and so on and so forth. Of course, even here in Santa Rosa is a little far from the center of population. But things are a bit more expensive down there around the bay.



The author struggling with the bureaucracy (illustration on the program cover of the 64th meeting of the Western Society of Naturalists at Simon Fraser University, Dec. 1987), inspired by a vignette from the late Edward Forbes (British Starfish, 1841-p. 197) drawn by W. Schuss without apology.

VII ENVIRONMENTAL HEALTH ISSUES OF SAN FRANCISCO BAY AND DELTA

Estuarine Studies

Lage: Now we need to turn our thoughts here to the San Francisco Bay, and I thought we'd start with--I know you've written about the history of scientific investigations, and I read your 1977 paper, which was very interesting.¹ I just wanted to pursue a few of the points that you made there. One, that all these engineering decisions on the bay were made without much knowledge of the biological needs of the system.

Hedgpeth: Of course.

Lage: And you particularly sort of indicted Stanford and UC Berkeley for not pursuing their own back yard.

Hedgpeth: They're still getting that kind of static.

Lage: Why do you think they didn't pursue this area of study?

Hedgpeth: I don't honestly know. Of course, it never occurred to most of them. Kofoid, though, tried to get it started, and he even got this guy Allen to work on the plankton of the river around Stockton. Then he went down to Scripps. That's the other thing, it started at Scripps, the marine biology thing, and that pulled a lot of people down south that might have gotten interested in the bay.

Actually, one of the best theses on estuarine processes ever done was Don Prichard's work on the Chesapeake Bay, it was

¹Joel Hedgpeth, "San Francisco Bay: The Unsuspected Estuary: A History of Researches," in *San Francisco Bay the Urbanized Estuary* 58th Annual Meeting, Pacific Division, American Association for the Advancement of Science, June 12-16, 1977, T. John Conomes, editor, San Francisco, 1979.

a thesis at Scripps on salinity exchange and how--see, when you have a layering of the ocean water underneath--it usually comes in underneath, and fresh water is on top. There is a zone between them there where things are mixing back and forth, and it's called a zone of no net motion. It means nothing is going strongly in either direction, they're just--

Lage: And it's a zone where the salt and fresh water are meeting?

Hedgpeth: Yes. And what is happening there, according to Prichard, is that oyster larvae, among other things, would rise to that level and move upstream against what appeared to be the main gradient, the fresh water coming down.

Lage: They're moving against that?

Hedgpeth: Yes. Anyway, he worked it out very well, and he had pretty good numbers for it. Very impressive job.

Lage: Numbers to demonstrate that it did happen, or to demonstrate why it happened?

Hedgpeth: Yes. He's been out here a number of times trying to tell people out here what to do. Of course, they invited this whole group a few years ago.

Lage: Who invited them?

Hedgpeth: Well, actually, the state agencies, Division of Water Resources, Water Board, Fish and Game, people like that, because they realized that they didn't have--see, this hearing lasted for nearly three years, and the board couldn't make a decision. Unfortunately, Fish and Game was under terrific pressure not to say anything. In fact, they were even suppressed or modified--

Lage: Not to say anything that wasn't in keeping with--?

Hedgpeth: The fact that it would interfere with the idea that we shouldn't be sending all this water south. Most of them knew that, but they just weren't allowed to say it.

I was born on the shore of San Francisco Bay, to begin with. But other than seeing starfish on the piling at the Key System pier and that kind of stuff, I never got much of anything in school. But of course, knowledge of life in the bay even around a city like Oakland wasn't very good. You get down along the waterfront, and it was just wharf and not much access to water. Where you could it was pretty yucky and tacky and all of that.

Lage: So it wasn't a place conducive to exploring?

Hedgpeth: We all used to go swimming in north Alameda, good old Neptune Baths. There's this picture of me when I was about four or five seated by the fountain at Neptune Baths; it's now Crown Beach, now a regional park. In fact, I gave them a copy of the picture of me. I don't know if they've ever done anything with it or not. Shows things about Neptune Beach they didn't have in the pictures they had there, obviously not the great grand staircase going down to the big fountain.

[An Encounter with the Archdruid¹

Hedgpeth: Some years ago, at a forgettable conference on Saving the Earth on the Berkeley campus I was asked, just before sitting down with the rest of the speakers in a final panel in Wheeler Aud, to summarize what was to be heard from the speakers. Discussion ended much too soon, and I found myself alone at the lectern. While trying to gather my wits I mumbled that although I was born in a large house a few miles from the campus where we could see the shore of San Francisco Bay from the roof, I had never expected to be at the lectern in a hall where I had attended many evening lectures and courses as a student. Then I remarked that one of my vivid memories was the spectacle of Charles Erskine Scott Wood, who often sat in the third row near the aisle, looking like Jehovah himself, who should be remembered for his opinion that the greatest offense of mankind was the fee-simple ownership of property (that produced a chilly emanation from the audience). One of the first comments from the floor came from David Brower:

"I don't believe you," he said.

"What don't you believe?" I asked.

"My mother wouldn't let me climb the roof," said he.

Suspecting an ego trip, I retorted: "Our house had a stairway to the roof and a widow's walk."

End of conversation.

¹David Brower is incorrectly alluded to as an archdruid in this (or any other) context. The archdruid is the presiding officer of the eisteddfod, elected by the Gorsedd or council of bards. His function is to bring the occasion to order and ask for peace: "Oes heddwch?"

Later, I found myself in the chow line just in front of Brower and wife.

"By the way," I said, "your mother-in-law was probably often in that house since she was a dear friend of my mother." Anne Brower nodded in agreement, and I sensed that further conversation was not welcome.

A few weeks later there appeared a newspaper account of Dave Brower's autobiography, illustrated in part by a photograph of the future archdruid at eight or nine years in a rig consisting of a wicker cart pulled by an elegant black goat. I could not resist sending the archdruid a copy of the photograph of myself at the same age in the same cart and black goat. I remember that I had been summoned from whatever I was doing to sit in the cart while the picture was taken, and then immediately ushered out of the cart (I thought that the outfit was to have been mine). For all I know we may have been photographed on the same day; we lived only about four miles or so apart.

I have never heard from the archdruid since.]¹

Lage: You and Dave Brower are pretty much contemporaries, aren't you, in age?

Hedgpeth: I guess so.

Lage: Fairly close, I would say.

Hedgpeth: I get a little fed up with his ego-trip business. He gave a great harangue before one of the bay meetings a while back.

Lage: He comes at it from a very different way--not from the science--

Hedgpeth: Yes, well, he's not particularly interested in the bay as such anyway. Liked to go climbing rocks when he was able.

Lage: But has he supported efforts to preserve the bay?

Hedgpeth: I think so, I don't know.

¹Mr. Hedgpeth added the preceding bracketed material, including the footnote, during his review of the draft transcript.

Estuaries in Texas

Hedgpeth: I really didn't get any understanding of what estuaries were all about until I went to Texas. Then you live in the middle of the whole system.

Lage: Is that where you started--your roots as an expert on estuaries goes back to that?

Hedgpeth: Yes. Well, see, before me there was this fellow Albert Collier who had been working for the Texas Game, Fish, and Oyster Commission, as they called it then. He had run a whole bunch of samples with data, he had a great pile of data running for several years. They had a hurricane down there, and Dr. Gunter said, "We've got to save that data," so he piled it all in a big box and took it up to his house, which was on reasonably high ground. Just got a slight green tinge from having the chlorophyll knocked out of the leaves along the front of the house. The house walls just sort of went in and out like a bellows a bit. It's reasonably sound. They were about sixteen feet above mean sea level, I think, which for that part of the world is high ground. [laughs] Well, the tidal range in the Gulf of Mexico is much narrower.

Lage: Where did this all take you in your study of estuaries?

Hedgpeth: Well, it took me to analyzing this data and trying to make something out of it, which I did. I published a paper under Collier's and my name, a joint paper, though I wrote most of it. He vetted a bit of it, but not much. Made it possible for him to get a job in the university.

Lage: It sounds like the estuary would really be a very intriguing thing to study.

Hedgpeth: Oh, yes, it's a very interesting process, especially in the part of the world where we had the gamut from fresh water clear to sea water three times as strong as the ocean, about 200 parts per 1,000 in some places. That's quite a lot.

Lage: So the salt water was saltier than the ocean, and then you also had the fresh water? Is that--?

Hedgpeth: Yes. Well, you see, we had no fresh water input down on the King Ranch. It was in, of all places, an area called Baffin Bay. Why, we never knew. No relation in any way, shape, or form to the Baffin Bay of Canada. [laughs]

The Sea of Azov

Lage: When did you go into studying the Russian estuaries? You studied the Sea of Azov, is it, and the Volga.

Hedgpeth: This happened when I came back to Berkeley to go on and get a Ph.D. I hadn't been around a major library for four years, so I did a lot of prowling about in the Biology Library, down the shelves, and I ran into this whole stack of stuff in Russian. I could tell from the diagrams and my limited knowledge of Russian that this was a significant body of work.

So finally, I think I helped to get a translation of some summarization volume of the [Biology of the] Seas of the USSR [by Professor L. Zenkevich, 1963]. I used that book in evidence at the first water hearings.

[tape interruption]

Hedgpeth: I wrote my thesis on the Gulf of Mexico and Texas bays, which had nothing to do with San Francisco Bay.

Lage: Did you work on this? [Zenkevich book] The author here has, "To my dear friend, Dr. Joel Hedgpeth."

Hedgpeth: Yes. Well, remember, I was working through the National Research Council and part on the treatise, and I recommended that this be made available. I think that had something to do with it. Not specifically stated there. I met Zenkevich in 1953 at the Zoological Congress. At that point, I recruited him to write the chapter on the Caspian Sea for the treatise. The chapter on the Black Sea and the Sea of Azov was done by Hubert Caspers, who had apparently spent a lot of time in Bulgaria during the war. According to Rozengurt, he was a member of the Gestapo. I don't know about that, but he certainly had quite a collection of icons, which considering the looks of them, probably were liberated from churches while he was in the German army. [laughs]

Anyhow, he was a collector. Poor guy, he's now lost his mind. I don't know whether he's still alive or not.

Lage: Did this book document the environmental destruction more or less of the--

Hedgpeth: Well, he very plainly states that in the Sea of Azov, the fishery stocks are dropping. That was why in '57, they knew something was going wrong. It was river diversion, apparently.

Lage: Do they point to the river diversion as the reason for it?

Hedgpeth: Yes. And I mentioned--see, I got involved in the hearings in 1969 in Sacramento, and there was very little material on the bay that you could use. Of course, the study of the marine borers brought a lot of this up, never carried it on very far, namely the--

Lage: What was that study? Marine borers?

Hedgpeth: Well, you see, in a drought period, which they had in the early twenties, late teens and early twenties, the salinity moved all the way up past Chippis Island to I think it was about eleven parts per 1,000. That is enough for borers and shipworms to come in and start chewing--the piling began to fail. Since then, they've turned to cement piling or steel-jacket piling.

Lage: Those animals don't thrive except where they have a certain level of salinity?

Hedgpeth: Right, yes. They are marine organisms, and they will survive some dilution. They are sub-estuarine sorts, but they have to have a certain amount of salt in the water, more than you should have for young salmon and the like.

Lage: So that was something that prompted a certain amount of study when the marine borers appeared?

Hedgpeth: Well, that was a bit of the evidence they had. The borers chewed up the piling, which failed, and that was a serious matter in harbors. Of course, they had the salinity curve as an indicator, which they hadn't sense enough to know what they were looking at; it was generally disregarded. So this was a renewal, and this is what I redid. I published parts of the original testimony, and a memorandum to the--see, under the Bay Institute, I worked for the Bay Institute--

Lage: Even back there in '69? Or are we up in more recent times now?

Hedgpeth: No, this was when we really got going with the bay.

Lage: When you first testified, it was '69 at the State Water Resources Control Board hearings.

Hedgpeth: Right.

Lage: Whose auspices was that under? Were you working for an environmental group?

Hedgpeth: That was the City and County of Contra Costa, they were suing for fresh water.

Lage: Yes, they have had a real interest.

Hedgpeth: Oh, they have had--well, a good lot of that changed--that old hack of a water lawyer [Walter Gleason]. He made millions. He never married. Some energetic mother superior discovered he was a Catholic, and went around and shook him down to endow the restoration of her convent and of Santa Clara University, as well as a few other little goodies. He was alleged to have been on all sides of every water controversy in the state since year one. As I say, he left an estate of several million dollars and no heirs, and it mostly went to the Catholic church.

Lage: But he'd take whatever side, he didn't just--

Hedgpeth: Oh, yes, sure. Whatever side wanted to pay him the most. He billed Contra Costa County something like \$650,000 for about eighteen months' work.

Research on San Francisco Bay--Geological Survey, UC, and Stanford #

Lage: You told me that you yourself haven't done that much research on the bay.

Hedgpeth: I first became aware--the first real job on the bay was that written by [Grove Karl] Gilbert in 1918, and it all started with studying what was happening with the mining debris.

Lage: So that was the initial interest, the mining debris and how that had filled the bay?

Hedgpeth: Well, I had picked up that report [U.S. Geological Survey Professional Paper 170] in Sacramento in 1938, in this funny little junk store opposite the main post office for fifty cents. The corps of engineers office was in the post office building. That was when we were working on the mountain streams. I picked it up and started to read it, and decided it was worth the fifty cents. I have had it bound in bright gold colors.

Lage: Was it a good piece of work?

Hedgpeth: Oh, it's a masterpiece.

Lage: Where was Gilbert from?

Hedgpeth: Upstate New York, graduate of University of Rochester. He became the chief geologist for the U.S. Geological Survey. He was the fellow who had contributed most of the solid ideas in Major Wesley Powell's work. He was a field man, one of the great students of the arid West. He was getting along in years toward the end of his career when this came along, and he didn't have to take it on, but volunteered. I don't know if that was before or after he got so interested in Alice Eastwood.

Lage: Oh, yes, that's the fellow.

Hedgpeth: I was surprised at the tizzy the gals over in the [California] Academy [of Sciences] went into when that all came out. It didn't occur to me it was generally unknown.

Lage: Were you the one who brought it out?

Hedgpeth: Well, I just casually mentioned that he had planned to come back and marry her. Stephen J. Pyne, who wrote the biography of Gilbert, found an actual letter of his to some friend saying, "We've been lovers for years." [laughs]

Lage: And the ladies at the academy didn't quite believe that, or--?

Hedgpeth: Oh, I think they were kind of pleased to know that dear Alice had known something about other things than herbarium sheets. [laughter] Anyway--[laughing] That famous picture of the woman standing right by the crack on the fault at Olema in 1906 is probably her.

Lage: We're not sure, though?

Hedgpeth: Well, what other lady would he be taking those days on a field trip to Olema? Of course, it was easier to get to than it is now. The train ran right up to Point Reyes Station and there was a hotel at Olema a few miles down the road.

Lage: You made the remark--I'm just now picking up a couple of things from that 1977 paper--you said that the biology department at Stanford has never been very environmentally oriented, or something to that effect. What do you mean by that? It's non-environmental in approach, you said. What does that mean?

Hedgpeth: They were--of course, at one time they were pretty strong on systematic biology. They had pretty good entomologists, and they had one of the major ichthyologists of the time as president, David Starr Jordan. George Myers was the last great

ichthyologist who built up the collection and trained many ichthyologists. It's all gone to the academy [California Academy of Sciences] now; Stanford junked all the collections. They cut off that part of their endeavors entirely. Of course, [Paul] Ehrlich is just a kind of a paper mill, really, for turning out tracts now.

Lage: When you say that, what's your implication, that his work is not based on careful research?

Hedgpeth: Oh, no, I think he's based on pretty good research. It's pretty good stuff. But he's emphasized that at the expense of some of the other things. Nevertheless, he is a specialist on butterflies, probably not quite as good as Vladimir Nabokov.

Lage: Has Ehrlich's direction influenced the department as a whole?

Hedgpeth: Oh, yes. There's hardly anything now as far as systematic zoology is concerned; the academy has to carry the whole load now. I don't know how long Berkeley will have a vertebrate museum; I suppose they're planning to redesign it, if they ever get through with LSB. It's taken how long now, four years at least?

Lage: Oh, I know it, and they're still not anywhere near done. But I thought that LSB is going to become the whole animal center, systematics and--

Hedgpeth: Yes. Well, I keep--I got a query from [William] Lidicker [professor of integrative biology, UC Berkeley] about a proposal to get interested in the bay. Didn't say it was about time they did, but he wrote a kind of a querulous note about hoping for my comments favorable, unfavorable, or whatever. I didn't know what to do with an invitation like that.

Lage: He was proposing that the university--

Hedgpeth: Well, the development people had sent down a request to all departments to come up with a memo or something. I said, "Well, you've got to study your quarry first," that San Francisco has never been very strongly noted as an oceanographic town or for funding oceanography. Go down to Monterey, there seems to be more interest there.

But anyhow, he said a couple of things that indicated he didn't quite understand what they required for having a study program on this, because the university already owned a piece of property there at the Richmond Station. This had come up before. I pointed out that at least they'd have to arrange for

a dock if they want people interested in studying the bay to come in as tenants for building, so they could make some overhead money and all that kind of stuff. The EPA had expressed some interest, but the EPA has not done much original work. They've regurgitated other people's stuff, become kind of a paper mill, at least around here.

Lage: So is there really a dearth of basic information to base a lot of judgments on?

Hedgpeth: Well, not exactly a dearth. Now we have pretty good--except some of the things are rather tricky, especially in the delta situation where you have water now going backwards and everything else.

Lage: As a result of the engineering decisions?

Hedgpeth: Yes. And the other thing that complicates matters is all these new or introduced species from the other side of the world that come in and have gummed up or changed the patterns of some of the populations. That remains to be really critically studied. Fish and Game didn't want to work too hard to get the kind of people they need to do some of this work, so there's a lot of things they didn't bother with, identifying a lot of the organisms they were working with.

Lage: Do you think this kind of work is better done by contract to a university, or better done in a government agency?

Hedgpeth: Well, we have the Geological Survey here, which is an exemplary outfit for this sort of work. But they've sort of--

Lage: They're not biological.

Hedgpeth: --somehow bootlegged this work into the system, and they're having trouble keeping it going. Of course, one thing they did was to kick Fred Nichols upstairs. He was doing a lot of the critical work. He's field director now for the whole region nine, and that's an awful lot of territory, including Washington, Idaho, Oregon, Nevada, California, maybe Arizona, something like that, which is a terrific lot of space to go over with everything that's going on.

Lage: Then you have the environmental impact reports, and you've commented that they haven't really had a very useful role in research results.

Hedgpeth: Well, the problem is environmental impact reports are contracted by the people who are trying to impact the environment.

Therefore, it follows that the firm that does the contracts figures out what side its bread is buttered upon, and acts accordingly. We've got several environmental impact outfits or consulting firms that have not done very well. And of course, locally it's been practically farcical. No state qualification or license is required for them to set up shop.

Lage: So they'll just turn out whatever results they're hired to do?

Hedgpeth: Yes, regurgitate each other's information.

Lage: Do they do good studies, or design good studies?

Hedgpeth: The last one we had for around here (it was based in San Francisco) was thrown out by the court as being hopelessly inadequate and they'd have to start all over again. That was the city [Santa Rosa] wastewater disposal thing. They wanted to build a dam on University of California property up here, and the university is objecting.

Lage: Up here, in this direction?

Hedgpeth: Yes, on Button Ranch over here across the hills.

Lage: Did you testify on that?

Hedgpeth: No, I didn't testify.

Lage: You didn't need to.

Hedgpeth: I didn't state anything about it. Well, I analyzed some of the reports. A lot of the things that I brought up were simply ignored and not addressed, as they say.

Lage: So environmental impact statements, from your point of view, haven't saved the world.

Hedgpeth: No.

Lage: They slow things down, though, and give time for--

Hedgpeth: Yes, I suppose they serve a useful function that way.

Lage: I think we've gone on long enough today, and we ought to take a break and come back to this another visit. How does that sound to you?

Hedgpeth: That's fine.

Testimony Regarding Water Rights

[Session 7: November 19, 1992] ##

Lage: Today we're going to continue with talk about the bay and your environmental testimony about the bay. Last time, we mentioned the 1969 testimony to the Water Resources Control Board. I wanted to start this time with the later testimony, which was '87 to '90. Just to give a general setting, what were the basic issues? It was again a hearing before the State Water Resources Control Board.

Hedgpeth: Yes. The later hearing, yes. It was by order of Judge John A. Racanelli. I think the conditions under which the State Water Quality Control Board was supposed to operate, they had responsibility for ecological characteristics or ecological matters as well as simply allocating water.

Lage: Was he the one that determined that, or that was agreed upon that they had ecological--?

Hedgpeth: No, he handed that down as a judicial decision. What happened was--see, these are linked to the previous thing of '69, which resulted in 1485.

Lage: Now, 1485 was a legislative bill?

Hedgpeth: No, that was the docket number for the decision of the original hearing concerning the rights of Contra Costa County to water from the Delta. That was the time I got up and pointed out that draw down of water for agriculture and industry was endangering the fish population, according to Russian information. At that time, I was living in Oregon, so I didn't follow the details down here very much.

But this got transmogrified into 1375, which was a later decision on a different year series, since the number is lower than the first one. And that one sort of eviscerated the first decision. But what Judge Racanelli has said later is that if he knew that the board was not going to come to a decision within three years, he would have set a time schedule to get it done before such and such a date, which is in his power in this matter, as the presiding judge.

But they didn't. They still have yet to act.

Lage: When did he set forth the requirement?

Hedgpeth: I was trying to remember. It was about 1980. It kept on going, and it's been going ever since. While we had these intense hearings lasting for at least three years--these are evidentiary hearings where everybody takes an oath, and where you have a rather formal procedure to go through. And if you don't get your thing right back in time, you never can get it back on the record. That's very annoying, too.

Lage: What is that?

Hedgpeth: Well, I mean, if you're not in precise order arranged for a rebuttal period or something, it will get out of your hand and you can't do much about it legally.

Conflict between Agribusiness and Environmentalists over Water Distribution

Hedgpeth: However, I'll point out that this all began, with me at least, in about 1939 or '40, when I had finished my first experience in field work with salmon in the Shasta Dam and all that sort of thing. We finished up the report in 1940, but it was buried by the bureaucracy and I went back to Berkeley and for a couple of years worked on a master's degree.

While I was there, I went over to the ag department, and somebody told me who to see, some professor whose name I forgot now, who was supposed to be a specialist in irrigation and water use. At that time, they were talking about the proposed Friant Dam. It hadn't been built yet, of course. I said to this fellow, "Well, I think the fish and wildlife people are going to ask for some release of water for the salmon run in the San Joaquin River."

This fellow said, "What are they going to do with that water? Waste it?" I went away shaking my head. Never forgotten that since. But that is still essentially the attitude of agribusiness in the valley. They say that people must survive first, and fish be damned. There is now Jason Peltier,¹ who's a great one for putting things in oversimplistic terms--

¹Jason Peltier, *The Passage of the Central Valley Project Improvement Act, 1991-1992: Manager, Central Valley Project Water Association, Regional Oral History Office, University of California, Berkeley, 1994.*

Lage: Is he an agribusiness representative?

Hedgpeth: He is. He's one of their spokesmen now. He started out as an employee of the Department of the Interior in the Central Valley Project, something like that. He wasn't very good at that either. But he has a way of talking that in this multiple purpose world, we don't have any time for single causes.

Lage: And he doesn't see his own as a single cause?

Hedgpeth: Well, I don't know whether you saw the Sunday program of *Sixty Minutes*, this gal talking about Forest Service being multi-purpose?

Lage: I didn't see it.

Hedgpeth: Oh, she was a terrible dragoness type, one of these overprecise females with a bitingly positive voice. "Of course, we have to let the cattle come in there; we've got to cut the trees also. This is a multiple purpose thing."

Mrs. H.: That was McNeill-Lehrer, three days ago.

Hedgpeth: Oh, was that Lou Lehrer? I thought it was *Sixty Minutes*. Anyway, it's been on both programs in one way or another. But I've said a number of times, and I've written letters to the editor saying that, the multiple purpose idea, which is a Forest Service favorite doctrine, simply invokes Gresham's law of ecology, that is, the worst ecological situation possible will be the end result of multiple purpose application. Well, that's the way it's happened.

Lage: And you see the same thing in the water situation?

Hedgpeth: Oh, you see it everywhere. See, the water is only one part of it. The other is clear-cutting, especially on steep hillsides where they drag all the trees and everything, increase the sedimentation and ruin the stream, and so forth. We said in 1940 that there must be some fresh water, cold water, for the salmon runs. Instead, they have built a couple of things they shouldn't have built. One of them was to knock a hole through the mountains and run most of the Trinity River into the northern Sacramento. Doing that, the river warms up through the pipe and power plant system and everything, so it comes out too warm for salmon anyhow. And of course, lower below the Trinity is practically a dead river now. [In a crowning example of malicious ignorance the Bureau of Reclamation sent bulldozers into the Trinity River last year to grub out all the streamside vegetation so the water would run faster and therefore cooler.

Of course it just got warmer and destroyed the refuges for the young fish under the banks. It was sheer insanity. --JWH]

Its major tributary, the Trinity, had so little water a couple of years ago when they held the White Deer Dance in the Hoopa Valley, which is at the mouth of the Trinity River just before it enters the Klamath, that they had to get a special arrangement with the Bureau of Reclamation to release enough water to float their boats. Part of the ritual is that they have these dugout canoes, made from a log of cedar or redwood or something, and there are three or four of the boats involved. They float downstream, come ashore at a certain designated place, and these all have some ceremonial significance.

I suggested to Hap Dunning [Harrison Dunning, UC Davis public trust lawyer] that the approval of this by the Bureau of Reclamation is a *de facto* participation in the religious ceremony, and perhaps was subject to a test about separation of church and state. He wrote down a note about it. There had been a case to this effect somewhere else, and he mentioned it at the meeting in 1992 in Sacramento, which I haven't dug up yet. I usually write things in bound notebooks, which is fine, but the thing is, I have a habit of picking up one which has some usable pages in the back and use those, so they're all mixed up.

Lage: So you don't know which is which.

Hedgpeth: Well, I have some vague idea. One of them I have indexed, so that helps a bit, but that's only one of them.

Lage: Well, that will give you something to do in your spare time, now.

Hedgpeth: Oh, yes, oh, yes. [laughter] And I really have to write this down because I'm going to have to write something about it.

Lage: When you made that first study in 1939, was that a revolutionary suggestion? Had it been suggested before that water be released for fish?

Hedgpeth: No. What was done was, because you could read between the lines of the project description, that the prior right on scheduling was going to be for irrigation, and second would be for power.

Lage: So your report wasn't heeded, I am assuming.

Hedgpeth: Hell no. I was trying to find out whether anybody in Washington has a copy of that original document, or where to find it. I

have a suspicion it just disappeared. It was about an inch thick. It's Special Report Number 10. Bill Kier made a copy of it, and my original has been deposited in the California Academy Library.

Testifying for the Bay Institute, 1987-1990

Lage: In the hearings in '87 to '90, you were testifying for the Bay Institute?

Hedgpeth: Correct. They were one of the major plaintiffs, between that and the Environmental Defense Fund, EDF, and other action groups.

Lage: Did they call together a whole group of consultants to testify, or how did it get organized?

Hedgpeth: They have their own people, the EDF has. Tom Graff was the chief counsel there for that. So they rely on their own people. Of course, the Bay Institute had just been started a year or so before that, and this was its first major appearance. So they asked me to help them out.

Lage: Had you known them before?

Hedgpeth: I knew [William T.] Davoren; he'd been rattling around for some time.

Lage: Is he a scientist, or lawyer, or--?

Hedgpeth: He's trained, I think, as a journalist, but he also had been a federal employee, too, and he'd picked up an awful lot of this material. Of course, I don't know whether Felix Smith is a lawyer or not, but he certainly writes like one.

Lage: Felix Smith? He's another Bay Institute--?

Hedgpeth: No, actually, he was officially an employee of the federal government [U.S. Fish and Wildlife Service], and he could not participate in this thing unless by order. They had pretty hard control over these people, and the state did also. Fish and Wildlife was more or less hamstrung for really coming out and saying what they really thought about this matter.

Lage: So people who may have known the most about it didn't testify?

Hedgpeth: That's right. Their testimony was more or less compromised. If they got out of hand, they would be reprimanded and/or transferred to some remote province or whatever they could do with them.

They tried sending Felix up to Portland; they didn't have anything for him to do up there. So they finally kicked him back to Sacramento, and he was given a little room by himself. He had tenure, and he had taken great care to have some very influential friends, people like [Congressman] George Miller and so on. So they didn't dare trample him too much.

But I've seen a lot of his memoranda--he wrote a great deal on the public trust. Some of the correspondence about this by attorneys within the federal government said, "This is not the federal position. We don't want to hear any more about it. It must not be released," and that kind of stuff. Of course, Felix went on and released it anyway, usually in forty-page memos. So he's quit now, and he's working for a private outfit, and he's a member of the Bay Institute's advisory board. I don't think he's quite as effective that way, but--.

Lage: You mean he was more effective from the inside?

Hedgpeth: Yes, because he could use all his energy on the one thing they didn't want him to do, because they kicked him off in a room by himself. Didn't want him infecting other people, and so forth.

So anyway, we went on with this, and various points.

The Sea of Azov Comparison

Lage: What was your testimony directed towards?

Hedgpeth: It was directed toward stating plain facts. The first thing I tumbled into, of course, was public statements by the deputy director of Water Resources and by some employees of the Bureau of Reclamation, I think, and also the Division of Water Resources, that because the Sea of Azov was completely land-locked--which is contrary to geographical fact--there could be no parallel or example in the Soviet Union for what is happening in the Sacramento-San Joaquin Delta. They even decided the facts of geography. This was, of course, pure poppycock.

Lage: They didn't look at their maps too carefully.

Hedgpeth: The Straits of Kerch, which connects the Sea of Azov and the Black Sea, are roughly two and a half miles wide. The Golden Gate is one mile. Gibraltar is about six miles, I think. Of course, the Dardanelles are practically down in the meter category, very narrow there, even for ships, and barely adequate for large subs to sneak in and out of the Black Sea.

But anyhow, I simply wrote this down with the dates of the statements I had heard about the Sea of Azov being closed off, and I noted them in my little notebooks. The first time, it happened at a hearing before [State Senator] Barry Keene in San Francisco--

Lage: That was a legislative hearing, then?

Hedgpeth: It was a legislative hearing. This woman got up, who was identified as a Stanford grad and a deputy director of Water Resources for the state of California. She laid that out absolutely flat.

Lage: That the Sea of Azov was landlocked?

Hedgpeth: Yes. Unfortunately, she finished just before noon, and after the noon break, she did not come back. So I contradicted her.

Lage: Without the pleasure of being able to encounter her directly.

Hedgpeth: Yes. And then they had one of these interminable "state of the bay" affairs in San Francisco some months later. She got up and said the same thing again. So it was obviously official policy to do this. So I wrote this deposition, which is primarily showing maps, and also the size of the systems is so different. Any ordinary Russian river is about five times as big as the whole Sacramento-San Joaquin system. Russia is a very large country. [I have since learned that the young lady has died. I don't know the details. --JWH]

Problems with Water Diversion in Russia

Hedgpeth: But what really caused the fur to begin to fly was in 1980, a session at Davis, the summer meeting of the American Association for the Advancement of Science, which was to concern San Francisco Bay problems. I went around, and lo and behold, there was this gentleman from Russia with a thick accent and a somewhat different approach to handling of statistical material than we were used to. He pointed out that the danger line for a river withdrawal was about 30 percent. Take more than 30 percent, you're going to be noticing decline in the environment.

Lage: He was a Russian who had studied the Russian situation?

Hedgpeth: He had been employed in the Russian hydrographic network. He was an employee of the Russian federal government. He and a group of others, including another man who's now in Connecticut named David Tolmazin, were a group of young Turks who were insisting this sort of thing was not good for the future of the country. They were asked to leave. They had the option of having life made very unpleasant for them. There's an awful lot of room out in Siberia for folks like that, and so forth.

Lage: Did they leave the country, then?

Hedgpeth: Yes. Tolmazin left, and Rozengurt left very soon after. Tolmazin apparently had studied English a lot more than Rozengurt had in Russia, and he's handling English better than Rozengurt, but he's in Connecticut and so he wasn't mixed up directly into this thing, though they were all communicating, including the people that remained in Russia, who were trying to do something about these things.

See, in addition to the diversion of water for irrigation and industrial purposes--power, and all that--water diverted for irrigation did come back later into the system. So you had fertilizers and herbicides and all that sort of thing, then the factories are using water in their processing or for power and are running through very poor refining systems or cleanups, so they're very dirty coming back, and a lot of the water going through domestic systems was not cleaned up.

Lage: So some of the problem could have been pollution, I would suppose?

Hedgpeth: It was. In addition to that, it decreased the water, and then you see, when you decrease the water, then you increase the

pesticides, the concentration gets higher all out of proportion to what the original was like.

Lage: So you don't get the flushing action--

Hedgpeth: And you're dealing with a steadily decreasing volume of water that's going back to the fish, but it's getting a steadily increasing higher load of pollutants, in addition to being warm. So it all gets into a kind of an exponential bind. And one of the things involved here is obviously a lot of these people in this state, especially out in the Fresno area, don't understand what an exponential increase means. Have no concept of that. In fact, they have no concept of tides, either. We've had a couple of people in the Department of Engineering at Berkeley who had even less concept.¹

Lage: Do they really not have a concept, or they just choose to ignore it?

Hedgpeth: Well, this guy Denton [Dr. Richard Denton]--I'll have to use his name--he was a professor of engineering at Berkeley. Did I give you a bit about the state of engineering at Berkeley?

Lage: You referred to it. I don't think you gave a full diatribe, shall we say.

Hedgpeth: What happened was that the gal who wrote the tule hypothesis wrote a special op-ed piece for the Sacramento Bee saying that, according to Dr. Denton, an instructor in the Department of Sanitary Engineering, the major factor in an estuary was the gravitational tides. [Sacramento Bee, March 27, 1989. "San Francisco Bay and its Pollution: Flushing the freshwater myth," by J. Phyllis Fox. This article so outraged Ray Krone, retired dean of engineering at Davis, that he wrote a rejoinder: Sacramento Bee, April 19, 1989. "Fresh water's vital role in Bay-Delta ecology," stating among other things that "Phyllis Fox presented broad-bushed superficial arguments to support the old saw that fresh water that flows to the sea is wasted." --JWH] She didn't use that word, but that the tide had a much greater swing and force than any amount of fresh water could possibly have. Therefore, it didn't matter whether there was any fresh water at all or not, because the tide would exchange everything. That fellow did not get tenure.

¹There are now several books in English about the impact of the Stalinist contempt for nature in the Russian environment, e.g., Weiner, Douglas S., *Models of Nature*, 1988, and Fishback, Murray, and Friendly, Alfred, *Ecocide in the USSR*, 1992. --JWH.

Well, that's not the way an estuary works. It may not be very much, but when you're adding the river water to a tidal system, and the tide is pushed up, and then the river water comes in as the tide goes out, it increases the speed of flow. As everybody who's navigated into tidal waters knows, the tide on the outgoing phase is much stronger and rapider than on the incoming tide. And this doesn't happen where there's no fresh water.

The simplest way to look at this is to go down to Baja California or the northern state of Sonora--that god-forsaken piece of landscape called the Jornado de Muerte--Journey of Death--north of Puerto Peñasco.

Lage: Is this all down in Baja?

Hedgpeth: No, it's on the mainland side. They have a number of lagoons that are quite saline. They just have salt water, they don't have any fresh water inflow, and they tend to stagnate up on the upper end. Evaporation becomes a main factor, then.

Using Some Texas Estuarial Data

Hedgpeth: Of course, I learned a lot of that stuff in Texas, as I told you last time. I didn't really start to understand tidal dynamics until I had been around a relatively simple system like Texas. In fact, I learned a great deal simply by writing up about five years' data accumulated by a previous employee of the Texas Game, Fish, and Oyster Commission.

Lage: Were the Texas estuaries comparable to the bay here, or were they without fresh water?

Hedgpeth: They're rather different. The tidal range is much less, but they have an extensive system of tidal gradients. Because of the history of the offshore bars and rising and falling sea level, you had a back (nearly fresh) bay and a front (intermediate) bay, and then you had the oceanic Gulf shore. One of the back bays is named Baffin Bay, why I don't know.

Lage: Baffin Bay?

Hedgpeth: Yes, like Labrador. Most unlikely comparison you could think of. It's quite often hypersaline, because for months, maybe sometimes years, there would be hardly any rain down below Corpus Christi, and then suddenly you'd get six inches of rain

in a day, something like that, and everything would be straightened out again.

Lage: Did that upset the organisms that lived there, that wide variation?

Hedgpeth: Not too much. They would kill off a few, but the main thing that affected the organisms was (a), getting too much salt in the summer, and (b), the quick freezes. It's very shallow water; a lot of them died, because there were bars that prevented them from getting back into the Gulf in the better water. So we had freeze kills quite often there in Texas. Anyway, it's an interesting different system.

But I worked all this data up, since I was employed without any thought of just what I was going to be doing besides validating the insurance. The professor who was in charge said, "Well, do anything you want to do." So I had decamped with all this Fish and Game data that nobody wanted.

Lage: What was the nature of the data?

Hedgpeth: He took temperatures and salinities, and depth measurements and that sort of thing, very standard type of thing, but he took an awful lot of it. So I wrote it all up, and I put his name as first author, and made it possible for him to get a university position also.

##

Hedgpeth: We were good friends.

Lage: What was his name again?

Hedgpeth: His name was Albert Collier. On doctor's orders he got out of the Gulf Coast climate, and being a gentleman with a stomach for this sort of thing, he wound up making a fair amount of money filming operations for the medical profession.

Lage: It's interesting how your previous work kind of fit so well with the bay issues. From Texas and then the Shasta--

Hedgpeth: There was no way to learn about San Francisco Bay at the time. I had really been exposed to it first off.

Measuring Water Conditions in the Bay

Lage: Do they have the kind of records that you wrote up in the Gulf for San Francisco Bay, the salinity and the tides and all?

Hedgpeth: Not for the whole bay, no. Because the main disadvantage is the bay is so large, and the other thing is that by that size alone, you have larger boats. The original studies were made by the research vessel *Albatross*, which had a draft of--I don't know what it was exactly, nineteen or twenty feet. The average depth of the bay is two or three feet. There are great, vast expanses of shallow water.

Lage: And it just couldn't--

Hedgpeth: No, you couldn't get--. All this boat could do was to sample up and down in the channels, which of course are more disturbed. They did get a pretty good line on the tidal system. That was fairly simple; you install gauges in the ends of docks every place you can think of, and read them, and balance them off, and you can get a pretty good idea of the tidal cycle or the tidal prism.

Actually, that was worked up by 1918 by a geologist by the name of Grove Karl Gilbert, who worked on that big job in the hydraulic mining debris study. He had been asked to do this, all this silt and gravel up in the Sierra--the Yuba and American Rivers especially. As you may know, they've piled up enough rocks lower down to build the Oroville Dam. That primary basis for the Oroville Dam is the mine tailings, especially from dredges in the lower river beds.

Lage: Rocks that washed down the main rivers?

Hedgpeth: Or that the dredges dug up. They also dug up the river bed and made great crescent-shaped piles and so forth.

Some of the more tricky hydrodynamic details were not worked out until Hugo Fischer came along.

Lage: When was that?

Hedgpeth: I first heard him in Pensacola--darn it, when was it? I'm trying to remember the date. He gave a paper on San Francisco Bay, and he was working at the UC Engineering Department. That was about five years ago. Now, in the middle of all the hearings, he died. Most of us didn't know that his hobby was gliding. He'd gone up to Reno for some kind of a tournament or

race, and nobody knows what happened because you don't see these things going on, but it looks like either he or somebody got too close to another glider, and they tangled a little, and he lost control and went down, and that was the end of him.

Lage: Was he a good guy?

Hedgpeth: He was very good.

Lage: And he came out of the Engineering Department at UC.

Hedgpeth: He actually came from Cal Tech to the Engineering Department, and he was bringing them around to a solid basis. Well, the sudden loss of him left them with people who didn't know how to carry on that work.

Lage: Who in particular? Are there people at UC who have testified improperly, or is it just that they don't take an interest and follow through with Fischer's work?

Hedgpeth: They don't understand Fischer's work, so they can't follow it through. Some of it is highly mathematical, of course. That was another problem. But oddly enough, the University of California has been responsible for one of the very best mathematical modelers related to salinity exchange in the business, namely Donald Prichard, who is a native of Maryland. He did his thesis at Scripps on the salinity exchange in the Chesapeake Bay and how, during the slack water periods, the larval oysters would rise up, be swept upstream, and then have sense enough to drop down as the water began to recede so they didn't lose the distance. And crab larva, the same sort of thing.

They were working in this whole system, and the whole thing came out as kind of a bookkeeper's balance. I attended his doctoral presentation. Of course, he had just finished reading the paper I had written for Albert Collier, too, and he was glad to see that I was in the audience. [laughter]

But Don has been out here a number of times. See, we had these people who were not related to Berkeley at any time who were capable of doing this kind of work, but not at Berkeley; it didn't produce them. Fischer wasn't there quite long enough to really get the thing going. So his sudden departure left a kind of a void there, which hasn't been filled yet, as far as I know.

Lage: And he was working on salinity?

Hedgpeth: He was working on what's generally called tidal hydrography. In other words, the exchange of tidal action, tides and currents, related to water masses and all that sort of thing. This is a very tricky subject in estuaries.

Lage: Is the bay model that the Corps of Engineers built of use in these matters?

Hedgpeth: Not entirely. It is of some use in the laminar flow aspect. You see, one of the problems with that model is that to get any depth proportional to the rest of the size, it would have to be several acres larger, because if you want to model, say, what is it, a couple hundred feet or more at the gate, you'd have to have a great big model so that the surface and the bottom area were proportional to the depth of the whole system, and it can't be done.

Lage: So they can't show the deep--

Hedgpeth: No. But they can show the kind of tidal currents and exchange of surface, and that sort of thing. But they admit--they know their limits. What they had built it for originally was to test the Reber plan. This guy Reber used to run around--I've written about him, you've seen that [see Appendix H, "Summary of Statement to the Natural Resources Subcommittee of the Committee on Government Operations"]--preaching this gospel of the thing to do with the bay was to dam it up so both north and south parts would become fresh, and then we could have all our fresh water, and then we could build ports in what is left of the bay.

Lage: And that was in the fifties, wasn't it, that they were talking about the Reber plan?

Hedgpeth: Oh, they still are. In fact, there was some guy who said what we need is a twenty-foot high dam at Carquinez Straits, and the editor of the Contra Costa paper wrote an editorial saying that we ought to examine this, how to do this.

Lage: Was this supposed to help Contra Costa's water problem?

Hedgpeth: Yes. Well, the only thing he didn't realize was that if you raise the level twenty feet at Benicia, Stockton's got wet feet. Stockton's about four feet above sea level, and--[laughs]

Lage: It's amazing, the ideas people come up with.

Hedgpeth: Yes, they do. They don't seem to know what the consequences are more than fifty yards from where they're working.

The Tule Hypothesis and the Oyster Shell Challenge

Lage: What was your testimony about bay oysters?

Hedgpeth: You see, what happened was that the tule hypothesis reared its slimy head.

Lage: Tell me what that is. Are we talking about the tule grass?

Hedgpeth: Yes. Well, it's not a grass, it's a very large sedge, I guess, or something like that. And of course, there were cat tails and everything else in the marshlands. The theory was proposed that at times past before all the subdivisions and pavements, there were great areas of the whole Sacramento-San Joaquin system which were vast tule marshes. And their rate of evaporation, transpiration and evaporation--evapotranspiration, they call it --was such that actually more water was pulled out of the system by these plants, and never got to the sea. Therefore, there being no more tules of any consequence, we were getting more water now than we ever had before.

Now, what was done, the first thing we really got--although I understand somebody had been fiddling around before with this notion, too, so it may not have been original with her--was the planimeter measurements. Do you know what a planimeter is?

Lage: No.

Hedgpeth: Well, I've got one, I can demonstrate if you'd like. It's a device, an analog device, for measuring areas on maps. It consists of a pair of arms and a little roller wheel that gives and takes as this thing moves around. So it comes out with a reading for the area, no matter how irregular the perimeter is. The scale of the map used is significant. If the scale is too small, like thirty to forty miles per inch, it's not detailed enough for the results derived, and a larger scale like two miles per inch is too much for the instrument to enclose. With the old-fashioned planimeter (which photos indicate was being used in this case) larger scales would be outside the reaches of the instrument. At best, with ordinary maps, these instruments are approximate. Now, the Japanese now have beautiful things that work on laser, and a lot of this whole analog stuff which was invented way back about the time of the French Revolution may be obsolete. The basic patents I know about are about 1850.

It's a tricky thing to do, because if you have a small-scale map, a lot of the little bends and indentations and so forth are masked out by reducing the scale and the needed detail

is not there. The other thing is following this, because what you're doing is you're moving this point vertically right around the bend of an irregular shape. If you check this out, say, and you've got squared paper of an inch square, reading your map as a mile to the inch or something like that, you can pretty easily check your accuracy on doing this just on the square of the coordinate paper, and reading it off. Even then, you will find that you should be doing it--I think the usual practice is to run the planimeter at least three times around whatever and average the readings.

So the first thing is the accuracy of the map you're working with. Now, the lady didn't say when she got up and first gave this testimony, and she sprung it about quarter to five in the afternoon when things are looking very bad for the water contractors. Some evidence was coming up that they didn't like, and so they threw her in ahead of things.

Lage: Do you remember her name?

Hedgpeth: Yes, her name is J. Phyllis Fox. She wore a pair of gaudy, dangly earrings, and square glasses at the time.

Lage: Is she a biologist or an engineer or--?

Hedgpeth: No. She got her degree in engineering on the fractionation of oil shales, a 444-page job, I believe. At least, the reference says that. Even double-spaced thesis-style, it's still a pretty long-winded thing. But it has nothing to do with this problem.

Lage: So I interrupted you, but she got up at quarter to five in the afternoon?

Hedgpeth: Yes, and presented this case, and said that the area was such that there might have been like twelve million acre-feet of water transpired out of this system [by the tule marshes] that now we have there.

There's one thing, the map she didn't mention until the seminar, an open seminar was held, and then she mentioned the map she used. But at that time, I didn't have--I didn't know she was going to do this, or I could have come prepared, but I wasn't prepared for that. The map is on the millionth scale, and that's sixteen and a half miles to the inch.

Lage: Did you have to ask her about this, or did she bring it up?

Hedgpeth: She mentioned the map by its name, and the question occurred to me immediately, which I didn't bother to ask her in public, was

whether she had used a large unfolded wall display map, or used the map that came with the book. She hadn't mentioned where she got the map, by the way. It might make a difference, because the folds on that map are equivalent to two or three miles at that scale of height, and bumps and dips could have pulled a map like that, and it's a map of California comes out about half the size of this tabletop, at sixteen and a half miles--a millionth, incidentally, is considered one of the standard scales. This is one of the scales of the first major map of South America, was made in the millionth. It's a fairly easy scale to work on. However, it is not very accurate, to say the least.

There is a little chapter in this book by A. Will Küchler, the man who designed the map, stating he designed it only for general display purposes, hypothetical areas, especially for tules and other areas of that nature where they had no good data, past or present. They didn't know really how much land was involved. But she goes merrily on as if she knows all this.

Lage: Now, did you know this from reading the book before?

Hedgpeth: No. I came home and looked at her source of data.

Lage: Did you have the book here?

Hedgpeth: Yes, I have the book here. This is standard reference. Actually, I don't know how I came by it. I think I got it from Science. I used to go to Washington every so often, I'd go up to the book review department of Science. They only review two or three books a week, and they get hundreds of them. They give most of them to some local needy college. Most of them are up for grabs. So I grabbed--some of the books they didn't review are marvelous things, on fauna and flora of the Adriatic, cost eighty bucks. I missed that.

But anyhow, so I got this book. I had never really used it much. It's *Terrestrial Vegetation of California* by Major and Barbour from the university at Davis, a standard work. They've got a new edition out now. They call it their door stopper.

So at the end of the seminar, she was asked from the floor by somebody what her margin of error was. "Oh," she said, "about 50 percent. That's only a factor of two," says she. I think that finished her with most of the people who really knew what this was about. Knew she was not doing very much, because a factor of two when you're talking about a difference between six and twelve million acre-feet, that's one hell of a lot of water.

Lage: It sure is. [laughter] Well, she must have been aware of that.

Hedgpeth: She probably was, but engineers get carried away with these numbers. They forget the implication of how far off you can get by using a bad number to begin with.

Lage: Now, did you have a chance to rebut her testimony then?

Hedgpeth: I wrote a rebuttal, and it was kind of funny. It was a rebuttal on oysters. Because what I said was that the major deposits of oyster shells around San Francisco Bay are all in the south bay. There are none in the north; there's hardly any oysters there. Most of these are gone now. The Anthro Department for years was studying these shell mounds in the 1900s, 1920s, and one of the biggest ones is right in San Mateo in 1930 when I was there. It's now completely obliterated by the Bayshore Freeway. Freeways run through practically all the middens all the way around the bay except the north bay, where there aren't very many. They are set way back, like the little one north of China Cove, just something up the hillside, and they really didn't make big middens, and they don't have oysters there except one or two.

Anyway, this rebuttal was prepared with a copy of the table of percentages of types of shell found in the bay, pointing out that because most of the fresh water that comes out of the upper system flows down and goes out the Golden Gate near the surface, only in very heavy rains does much of it get south. Therefore, the southern part of the bay has already been more salty than the northern part. It's probably been like that for 5,000 years because oyster shell is a major source of limes for industrial purposes in the south bay; there has been a regular dredging for that. I cited all these references.

Well, something happened and we didn't get in on the scheduled date. We had it already typed up. I guess a couple of the copies got loose, because she got hold of the advance copy. So she comes sashaying up and says that my testimony had no value at all because, in spite of what I had said, my own graphic material indicated that oysters occurred everywhere in the bay. Well, the only record in Carquinez is about one-half of one shell. The graph table very plainly states and indicates that's the lowest value, too small to estimate.

Lage: I'm not getting the connection, somehow, between her testimony about the amount of water that came out, and your testimony about the oysters.

Hedgpeth: My testimony is the fact that the amount of water coming out of the bay was as much as it is now or probably more, because it kept the oysters in the south part of the bay. They didn't get up in the north part of the bay.

Lage: I see, it kept them pushed down in the south.

Hedgpeth: Yes, and they couldn't raise oysters in the north bay.

Lage: Because there wasn't enough salinity?

Hedgpeth: There was too much fresh water. And at Tiburon, for example, Victor Loosanoff came over there from the East to do some work with oysters, and he had to move out to the ocean shore at Dillon Beach, because the water was too fresh at Tiburon in the winter and interfered with the experiments.

Lage: I see. So by tracing where the oysters were over time--

Hedgpeth: Yes. That's what I did, and it's straightforward. Well, anyway, Jim Sutton, the biologist for the state water board and his staff man said they knew it was all a bunch of malarkey in the beginning. They thought it was sheer--

Lage: That she was--

Hedgpeth: Yes, he said it had no meaning for them. But of course, these people at the hearing board are lay people, not always quite as up with things as the rest of them. But anyhow, that was that. Later I dubbed her Nuestra Señorita La Reina de los Tulares.

Lage: Tell me about the hearing board. What kind of people are they?

Hedgpeth: They were all appointed; they were mostly agribusiness types. They're private citizens appointed to the WRCB by the governor and by Willie Brown, and two or three other people have choices in this matter.

Lage: And they're not necessarily biologists or hydrologists or--

Hedgpeth: No, they're just people who are interested in--turns out most of them are agribusiness types.

Lage: How well do they receive the testimony?

Hedgpeth: I don't know. They never say much of any--

Lage: Do they ask questions?

Hedgpeth: No, they don't ask many questions on these things. Of course, a lot of it is a little too much for them, they don't understand fish populations and that kind of thing. Fish and Game had a lot of that sort of stuff.

Lage: Do you try to key your testimony--do you testify verbally as well as in writing?

Hedgpeth: Yes. Usually when you get up to present a case, you give a spoken summary.

Lage: And then you give them a paper.

Hedgpeth: Yes. The paper has more details.

Lage: When you were giving your spoken summary, do you try to think about their level of competence?

Hedgpeth: I do, of course. You try to make it plain to who you're speaking to, because this is the only time they'll ever get it. They probably won't read this stuff that they're getting. Well, actually, the thing amounted to about two stacks of this high [gestures] by the time they get through with it. Some of it's frightfully long-winded. [The total stack of paper generated by this hearing reached a height of twenty feet! --JWH]

Striped Bass Population and the Flood of 1863

Hedgpeth: Then I wrote a little skit about the striped bass, pointing out that we should have--we don't know the conditions under which they managed to become established in the period of about one and a half years. They exploded almost instantly; it was quite a phenomenon. [laughs] For example, one of the silly things, they were transported out here in porcelain-lined tanks--

Lage: What time period are we talking about?

Hedgpeth: 1879.

Lage: Oh, way back.

Hedgpeth: Yes. And so they kept the tank temperature very carefully, and its salinity. These fish were estuarine water types anyway. And they brought them all the way out from New Jersey, and they went out on the pier in Martinez and dumped them in the bay, and they

didn't take the temperature or salinity of the bay. [laughter]
It was funny.

Lage: After all their careful concern.

Hedgpeth: Right, yes.

Lage: So what happened to them?

Hedgpeth: They just exploded. They took off.

Lage: Did they destroy a native?

Hedgpeth: We don't know. One of the things we don't know--my reason for saying this is that in 1862-'63, we had the greatest flood of record. It flooded the entire northern part of the Central Valley up to about thirty feet. The legislature had to adjourn to San Francisco. Sacramento was flooded out. If that ever happens again, think what all those big places like Marysville and Oroville would be under water, and highways, they'd all be--that would really be something if that ever happened again.

What they think happened was two big storms, one from the south and one from the north, collided probably right around Sacramento, and San Francisco Bay was fresh for about six days or more. Of course, the academy was flourishing then, so they kept some records on this.

That flood aspect is discussed in that Conomos book on San Francisco Bay. They try to estimate the total flows from what little they know of the thing. But they've never had anything like that since. And of course, we may never have had a drought like this before, so we don't know what's going to happen. Sometime we may get something like that. Boy, run for cover. If you think an earthquake can fix you up, a flood like that won't help either.

Lage: And that wouldn't be controlled by all the dams that they've built?

Hedgpeth: No. Dams only have a certain capacity. If they can't hold it all, it would be going over the spillways before you know it. See, the situation we have now is that the lovely Division of Water Resources decided to take a risk on the possibility that we might have some rain again, so they ran the water too far down. The total amount of water now in the reservoir is not enough to carry next year.

Lage: The minute we get that spring rain, they seem to think the drought is over.

Hedgpeth: That's right. And they're silly. They should look at the tree ring records. It shows this kind of fluctuation. Texas quite often has had seven-year droughts. Of course, that's a different system down there.

Lage: Let's see, let's finish the striped bass.

Hedgpeth: Oh, well, I just wrote this little skit about that, apropos of nothing except somebody made some comment about it, and they said the problem is in reference to what they have to decide about striped bass. We don't really understand just what went on to make it possible for them to take like that. We just don't have the data. We don't know where they go. You see, it may have been related to the flood of 1862. It wiped out a lot of things, so there was a lot of probably unoccupied space around for other things to flourish in.

Outcome of the Bay-Delta Hearings

Lage: What was the outcome of the hearings, those three-year hearings?

Hedgpeth: Zilch.

Lage: In what way?

Hedgpeth: Their decision was simply to allocate water, a little less maybe, but that was all.

Lage: To allocate some water to the Fish and Wildlife?

Hedgpeth: No, irrigation only.

Lage: They are still focused on irrigation?

Hedgpeth: Oh, yes. The chief attorney for the water contractors was a character named Arthur Littleworth. I think he's still around; I haven't heard that he died. Fellow I started under in this business was Walter Gleason, that was in the '68-'69 affair, and he was alleged to have been on all sides of all water fights in the state sooner or later. Gleason, it turned out, didn't have a family, he was a bachelor. His fee for the Contra Costa thing was something like \$675,000. There was a lot of squabble about that, but he convinced everybody he really earned it.

Lage: He was really worth it.

Hedgpeth: Oh, yes. But he was kind of fun to work with, at least as long as you're on his side. He coached us before we went on the stand.

##

Hedgpeth: Anyway, old Littleworth got to me; I forget what I was saying at the time about water. He said, "Are you discussing impaired or unimpaired flows?" Well, unimpaired flow is a hypothetical type of flow, as if things had never been changed. So I said, "Well, sir, I was aware that water contractors have special meanings for this term 'unimpaired,' so I really can't answer, except that I would say it was before the stream was impaired by the construction of a dam." He didn't like that answer at all, and kicked me off the stand. [laughter] Anyway. So that's the way it went.

Well, in some ways it was fun, and in other ways it wasn't.

Lage: But there was really no beneficial outcome?

Hedgpeth: But you see, you were asking about the other--I didn't hear much of the other testimony, except the day I was there. Most of the time it would be Fish and Game and stuff like that. But some of the other things I didn't know anything about. Because we'd have to drive up to Sacramento, stayed overnight one night I think it was--something came up, we had to be there the next morning.

Testimony by Scientists on Public Policy Issues

Lage: You made remarks about scientists that sort of sell themselves?

Hedgpeth: I didn't make that in public. That would be actionable. Then the gentleman who had in mind to do most of this showed up, of all places, here in Santa Rosa at a hearing on sewage water. That was 1985, in the famous year of the turds. You see, the city got overloaded and dumped everything straight into the Russian River, and those people still remember it, and they're fighting to the death any scheme. Now that their treatment is so changed that the state Water Quality Board has said, "Well, you can release it in the river now, it's fit to drink." Blech! Well, anyway, nobody quite believes him, even though the chief

water engineer gets himself photographed on every occasion drinking a cup of it.

Well, anyway, this guy got up, and he's a member of the faculty of engineering at Berkeley, and says, "Hi, I'm a professor of aquatic ecology" from the university. Well, that title is not, as far as I know, at least the exact way he worded it, is not on the roster at Berkeley.

Lage: Aquatic ecologist, especially in the Department of Engineering.

Hedgpeth: Yes. Well, he didn't say he was in the Department of Engineering, but I knew that. But he said, "You can stand there at the end of that big sewer pipe in the East Bay and you look down, and all you see is nice, clear water. There's no baddies in it." These people seem to have a knack for coming off with these cracks just before lunch, because he disappeared. Afterwards, I got up and I said, "I have to disagree with that statement because there are many things in the water you can't see. Those are the real baddies." Sat down, and Tom Lynch got up and referred to him as "Your Judas goat consultant." [laughter] I don't know whether he'd been back to town or not, but at any rate, he has appeared at several places where he's been roundly denounced for inaccuracies in testimony.

Lage: So do you have the sense that he's not necessarily testifying to what he believes but what he gets paid to testify for?

Hedgpeth: Well, that's a rather awkward thing to say. He may actually believe these things. He obviously doesn't understand the scientific method. He doesn't know how to set an experiment up so it really proves anything, in other words. What he wanted to do, for example, to test the effect of pollution on mussels was to--you have a 5,000-gallon tank of water pumped from the bay, into which he got mussels from the end of a pier and put them in there, and said, "Lookit, they live here, so the bay's water is all right."

Well, he pulled that in San Francisco at the American Geophysical Union, or rather, one of his students did, and the audience really gave him hell. There was no experiment, he had no controls. Well, the fellow said, "Oh, we can control the quantity of water, we know how much we're using."

Lage: It sounds like he's a little bit outside of his field.

Hedgpeth: Definitely. I don't know what he did to get his degree.

Lage: Is it somebody whose name you'd want to mention?

Hedgpeth: It's Alec Horne. He was going to work up the Aquatic Habitat Institute as a way to support his schemes, the Corps of Engineering Department, and nobody wanted him to do this. Somebody--not me, I don't know enough about the university--found out there were rules against funding a university department directly by the state Division of Water Resources, from one state purse to another. It was one thing to support students as such, and research, but another thing to support a whole department directly. So they kicked it about and now it's quasi-independent, one of these several outfits around the bay that more or less reinterpret other people's paperwork.

Lage: What's it called?

Hedgpeth: The Aquatic Habitat Institute, one of them. And then the EPA has funded--they funded ABAG [Association of Bay Area Governments], of all places, and they don't have anybody who knows anything, I guess. They tentatively remarked that, "Well, the tule hypothesis has been protested by some people, but there still remains the fact there is less water now than there used to be." So I accused them of trying to go to bed with Nuestra Señorita la Reina de los Tulares [Our Lady the Queen of the Tules--a take-off on the full name of Los Angeles], and I wrote this letter to them about two months ago, and I haven't had a response.

Lage: I wonder why?

Hedgpeth: I wonder why too.

Lage: Did you expect one?

Hedgpeth: I sent copies to the EPA directly, as well as to them, and quite a few other people. But anyhow.

Lage: Now, you have not had any reluctance to get involved in controversial public policy kinds of issues, as a scientist. Is that standard in your field?

Hedgpeth: I don't know. I got asked to by Aquatic Habitat Institute. Of course, that thing up here about sewage water, that was just sitting there, and I decided I ought to say something, somebody ought to say something about that kind of testimony, as soon as you can--.

Lage: But do you find that scientists get engaged and use their scientific knowledge to affect public policy? In the scientific community, is there any hesitancy to do that?

Hedgpeth: I think there's some people--if you've got a reputation to defend, you can't just go around taking up too many causes. What they're doing, of course, and more significant, is they're working for consulting agencies, so they present the line which the consultants want, and the consultants are presenting the line which the employers want, which is usually some branch of the local government.

Lage: So from your observations, a lot of scientists sort of bend their science to whoever they're hired by?

Hedgpeth: I think it's worse than that. I don't think they just have enough knowledge to back up what they're saying half the time. They haven't been to the right places to really get hold of the subject, so they--

Lage: It's not good science.

Hedgpeth: Yes. Well, another young character, he was a student of Dr. Horne's, wrote a deposition which seems to have been drafted by the city attorney--there's a lot more legal stuff in it than there should be--pointing out that he defined a project area as --for instance, a reservoir would be the upper shore of the reservoir. So anything above that limit wouldn't be affected by what you were doing. Well, he was commenting on a statement made which he didn't read, saying that obstructions or barriers would have to be installed to keep fish from swimming upstream to get into other places where he didn't want them. So I pointed out that the project area is the whole region, above the reservoir and below it, all the way to the sea. Of course, the stream's only twelve miles long, and you can't define a project area that way. I think he's just naive and uninformed.

Lage: And being considered an expert.

Hedgpeth: Yes. I was asked to say something in a rather funny way: one of the chief planners, the owner of the adjacent property, sent me his legal brief and said that their attorney wanted to hear what I had to say about it. So I wrote two pages, and I told somebody else it was so much fun doing this, I wouldn't charge anybody for that. [laughter]

Lage: Does the Bay Institute pay for testimony? Or do you think it just--

Hedgpeth: I don't know. They paid me for a couple of these things. I was taking off a lot of time, I charged \$100 a day. But that's nothing.

Lage: Have you done other consulting since you retired?

Hedgpeth: Of course, you see, that other thing, I hadn't retired. I was at Oregon State as a faculty member and they brought me down here. That was very funny in some ways, because I was testifying about salmon migration--this was the water board people. They'd brought in a fellow from the faculty at Oregon State to advise them on how to handle people like me, and I was talking about the latest paper I'd read on salmon migration. I said, "Of course, this is preliminary data, but it's rather suggestive. And by the way, it is written by Dr. Donaldson's father." Dr. Donaldson was the guy who was brought down to counter me.

And one of the attorneys started to fidget, I saw Jack go, "Shh, shh--lay off of this." [laughter] It was funny. We had a good laugh over it afterwards. I didn't even know he was on it, and I don't think he knew I was on it, either, at that point.

I know that several times he waved off the attorneys who were about ready to jump off the deep edge. It's awful easy for attorneys to do in these technical things.

Lage: You kind of have to train the attorneys?

Hedgpeth: Yes.

Questions for Future Bay and Delta Research

Lage: You mentioned in, I guess it was the article in the Conomos book, is it, on the bay as urbanized estuary, that the significant questions weren't being asked in the bay/delta research. Is that still the case?

Hedgpeth: Well, they're getting there now, I think. Of course, it's very expensive to ask some of the significant questions.

Lage: What are the significant questions?

Hedgpeth: See, they come up and they say they don't have any real clear relation between salinity and so forth. I just turned up something yesterday; I was a little shocked I had never read it. It was written in 1970 by a colleague down in Texas, Curly Wohlschlag, who I knew pretty well, on the incremental effects

in estuarian systems of how just a very little can build up to critical effects on population changes.

Lage: Very little changes in the system?

Hedgpeth: Yes. And they build up on top of that, and before you know it, you're sitting around looking and you've got no fish. Of course, we knew we were going to have no fish if this kept up. But agribusiness doesn't believe that.

Lage: What kind of research should they be doing, or are they doing that you are encouraged by?

Hedgpeth: I think they are now, because they've set up this system of funding, partly because of the Shubel report. These people from the East including Shubel and Don Prichard and other folk, were retained by the Fish and Game and the DWR and the federal bureaus to come out here and study the matter, what was needed to get the San Francisco Bay off its dead center.

They came out with it pretty clear. The first thing was to get the universities involved. Of course, now they're going to cut off the only courses they have on San Francisco Bay, because they can't afford all that.

Lage: At UC?

Hedgpeth: Yes. Doris Sloan [UC Berkeley lecturer in environmental science] has run off, taking early retirement, so I don't know what's going to happen with--see, she had been handling 275 students or something, but they weren't going to give her any T.A.s or any assistantship. Besides, she's a grandmother. She had several strikes against her, being--I guess she's over sixty now, and coming in very late in the system, would count against her. So when they offered her a golden parachute deal, she grabbed it, I gather. She says she'll hang around and participate in things, but I guess she won't have that teaching load, and I doubt whether anybody who's around is going to take it over.

Lage: And she was teaching the course on the bay?

Hedgpeth: Yes. Among other things, I gather.

Lage: Well, that's not encouraging.

Hedgpeth: No, it isn't. But I don't know what happened here. A funny letter from the Integrated Science folk, Integrated Biology folk, about some schemes they had for the Richmond Field Station

property, which has got a considerable bit of real estate around there. So I started my response with a quote from guess who. I said, "Call me Ishmael; I'm the only one left to tell the tale." [laughter] I don't know whether Bill Lidicker knows what that means; I suspect he does.

Lage: Hopefully.

Hedgpeth: Hopefully, yes.

Lage: Is this ending on a more encouraging note, or a discouraging note? You said you do think some of the proper research is going to--

Hedgpeth: Well, I hope, but I don't know. The Integrated Biology people seem to be a bit innocent in the way they started at it. But then Lidicker is an upland rodent man.

Lage: Do they have good people in marine biology?

Hedgpeth: Should have a couple. They have Jere Lipps there as chairman. He ought to know something.

Lage: Any former students of yours?

Hedgpeth: Not that I know of, unless you count Doris. I coached her on her prelims, that's all. [laughs] That was kind of funny.

Lage: She went back to school as a mature woman, didn't she?

Hedgpeth: Yes, right. She'd been a sociology major at Bryn Mawr. And of course, her father is a zoologist. She didn't make much of that. I don't think she cares whether you know it or not, but anyway, he's Viktor Hamburger at the Washington University at St. Louis, Missouri. He came over to escape Hitler in those days. She was about four, I think, when she was brought over. I met her when she was our neighbor in Sebastopol.

But anyhow, she came around to me and said she didn't know just what they would be asking for invertebrate zoology. I think she knew I had been a guest of the Paleo Department for a couple of years in a rather peculiar arrangement. They had asked me to participate in their prelims so they wouldn't have to have those characters from down in the swamps of LSB mistreating their star students. Of course, students, all they knew was about what they found in rocks, you know, in paleo. I said, well, I would do that if they happened to attend my summer course at Dillon Beach, not that I needed the trade, but at

least I would know something about them. So that's the way it was set up.

Lage: So you sat on their prelims?

Hedgpeth: Yes. I remember one time I had a little box of gravel, very small pieces of gravel; with paleontologists and geologists, the size sorting and character of things like this is rather important. So I asked the candidate to suggest the sorting influence or sorting agent. Because they were all the same size, and they were all irregular, rough shapes.

He looked at them and said, "Well, they're not water, and not air. Seeing as you're asking the question, I guess they're biogenic." I said, "Well, all right. What next?" He gave up. I said, "They're sorted by ants." These are the pebbles on top of the harvester ant hills up in Modoc County. I had gathered them up for possible railroad ballast in a model railroad project.

So after we threw him out in the hall to stew for five or ten minutes, the first thing out of the hat was a mineralogist, old Garniss Curtis himself. He said, "Well, I'm glad nobody ever asked me that question." [laughter]

Lage: It does look like kind of a hard one to deal with.

Hedgpeth: Well, I think it was tricky, unfair. [laughter] But the main thing is, you want to get the candidate in a position where he can't fake anything, he has to give up. Then you're all right. These characters who blithely make up something out of whole cloth; you worry about them.

Lage: And they're fast talkers, and--

Hedgpeth: Yes. [We lost Doris. I told her to study her committee, and not to try to bluff when she didn't know the answer to a question, but to say she did not know and maneuver to change the subject, and if she could get the committee to argue with each other, she was in. She didn't have to do that, but she passed easily. A couple of weeks later I was seated beside a member of her committee at an evening dinner, and he said that they had a very fine examination with Mrs. Sloan, and then he said, "I wonder who coached her." As if he didn't know, because I was sure he'd seen me around the department, so I answered, "I have no idea." --JWH, October 1995]

Lage: In general, do you think the young people coming along in marine biology are of good quality?

Hedgpeth: I don't know many of them right now. We turned out a few pretty good ones at Dillon Beach, mostly from the high school and junior college teachers. One of them went on to become a specialist at the U.S. National Museum for a while, and then he had to go into consulting because that wasn't paying enough to support a family, which is true. One of them became the chancellor of the entire junior college system, which wasn't what we were intending to do for him, but--

Lage: But anyway. [laughs]

Hedgpeth: Yes. That was Dave Mertes.

The Roman versus Celtic View of Life

Lage: Let me ask you, I was looking at the list of your lecture topics, and the one on the environmental movement as the latest phase of the battle between Roman practicality and the Celtic view of life was very intriguing. Tell me about it.

Hedgpeth: Yes. Well, just having a little fun. You see, you'd have to look at my library to see that bunch of Celtic books there, some of which I've read and some of which I haven't read, in most of the Celtic languages. But anyhow, this lovely passage in a book by a man who wrote under the name of Fiona McLeod, whose name was James Sharp, I think, about the mothering, how a mother takes her baby out as soon as she can after it's born and touches its head to the earth. Called "the mothering." He said that was carried out at least when he was writing, which I guess was in the 1890s or somewhere along in then. But that's very late for that sort of thing. That must have been in the Highlands, where the custom would endure.

But there is that feeling, because very few of the Celts wherever you go are big city dwellers, except maybe the Irish at Dublin. Most of them do live fairly close to nature. And then, of course, I point out that this poem about the squirrel going to London to fight the cutting down of the trees is the first environmental protest of record [ca. 1570]. I opened my talk with the Eisteddfod invocation, just for the fun of it. Got an old sword which was secularized by St. Vincent de Paul, secondhand joint, you know. [laughter] It was an old Knights of Columbus sword. The chief bard starts the Welsh cultural festival by asking, "Is there peace in the land?" "Oes heddwch?" [Is there peace?] And asks this three times, and finally the audience cries back, "Heddwch!"

Lage: And what does that mean?

Hedgpeth: Peace, yes. That's the opening part of the ceremony. They dress up in fancy bathrobes and indulge in all kinds of folderol, most of which was made up by a rather cynical Welshman in about 1850 or so, as a bardic revival. But anyhow, that's neither here nor there.

Lage: And then what's--

Hedgpeth: Well, you just get this feeling for nature from the Celts. They're always fighting about it, protesting what is going on. Part of it is also protesting the English.

Lage: Now, what's the Roman practicality?

Hedgpeth: The Roman law and all of that, yes. Building bridges, and all those roads.

Lage: The engineering mentality.

Hedgpeth: Yes, right.

Lage: Do you think your Celtic roots have influenced your outlook?

Hedgpeth: I don't know. I think I had some fun with people; I don't know. May have influenced me a little, but anyhow.

Lage: It's hard to sort those things out.

Hedgpeth: Yes.

Recognition for Work to Save the Environment

Lage: In 1976, you got the Browning Award for achievement in preserving the environment. Who was that given by?

Hedgpeth: Mr. Browning, who left a sum of money to the Smithsonian Institution to be administered for people who--he had a series of categories, I forget what they all are now. I don't know whether the brochure is near there or not; I used to have a brochure about it up here.

Lage: Was that sort of a lifetime achievement award?

Hedgpeth: No, it was just done once every year.

Lage: But I mean, for your recognition, was it for a particular thing, or for--

Hedgpeth: That's right; no, it was just for general activity. I think in all of them. It wasn't because I'd written for a special paper or book or anything like that. Well, at that time, it paid \$5,000, and later on they were beginning to run low on money and they dropped it a bit.

Lage: So you got it at the right time.

Hedgpeth: Yes, I got it at the right time. By the time they got to Starker, it was only a couple of K or something.

Lage: Does it often go to scientists?

Hedgpeth: No, there's one category for "Conserving the Environment."¹

Lage: Let's just mention also that you were awarded the Fellows Medal of the California Academy of Science just recently.

Hedgpeth: Yes. Oh, they put on the back what they think it's for.

Lage: [laughs] Well, I have down here, "In recognition of outstanding contributions to invertebrate zoology, marine ecology, and responsible use of the environment."

Is there anything else you want to add?

Hedgpeth: [Since this interview began I have been elected a foreign member of the Linnean Society of London, in recognition of my work as a systematic zoologist. --JWH]

Transcribers: Chris DeRosa, Shannon Page

Final Typist: Shannon Page

Editor: Anne Apfelbaum

¹"For the person who has made an outstanding contribution in enhancing the quality of our physical environment. Nominees are proposed by the Smithsonian Institution." --Browning Award announcement. [See Appendix I.]

TAPE GUIDE--Joel Hedgpeth

Interview 1: June 25, 1992	
Tape 1, Side A	1
Tape 1, Side B	8
Tape 2, Side A	18
Tape 2, Side B	25
Interview 2: July 2, 1992	
Tape 3, Side A	34
Tape 3, Side B	35
Tape 4, Side A	45
Tape 4, Side B	58
Tape 5, Side A	70
Tape 5, Side B	80
Interview 3: September 2, 1992	
Tape 6, Side A	83
Tape 6, Side B	94
Tape 7, Side A	106
Tape 7, Side B	117
Interview 4: October 1, 1992	
Tape 8, Side A	122
Tape 8, Side B	133
Tape 9, Side A	143
Tape 9, Side B	153
Interview 5: October 15, 1992	
Tape 10, Side A	156
Tape 10, Side B	166
Tape 11, Side A	175
Tape 11, Side B	186
Interview 6: October 29, 1992	
Tape 12, Side A	196
Tape 12, Side B	206
Tape 13, Side A	217
Tape 13, Side B	228
Tape 14, Side A	238
Tape 14, Side B not recorded	
Interview 7: November 19, 1992	
Tape 15, Side A	243
Tape 15, Side B	253
Tape 16, Side A	265
Tape 16, Side B not recorded	

APPENDICES--Joel W. Hedgpeth

A. "A Boy's Life at Mather, 1921-1922" by Ted Wurm.	278
B. "Sea Spiders (Pycnogonida)", introduction to the proceedings of a meeting held in 1976 at the Linnean Society in honor of Joel Hedgpeth, and a listing of Hedgpeth entries in "A pycnogonid bibliography."	282
C. "Ed Ricketts, Marine Biologist" by Joel Hedgpeth, from the <u>Steinbeck Newsletter</u> , Fall 1995.	293
D. Letter from Aldo Leopold, 1947.	295
E. "Progress--The Flower of the Poppy," by Joel Hedgpeth, in <u>American Scientist</u> , vol. 35 (3) 1947.	296
F. <u>Treatise on Marine Ecology and Paleoecology</u> , 1957, Foreward and Contents.	300
G. Family placenames: Tichenor Rock, Nellie's Cove, Nellie Lake, Hedgpeth Heights.	302
H. Statement on San Francisco Bay-Delta Estuary--An Ecological System, 1969.	303
I. The Edward W. Browning Achievement Awards, 1976.	305
J. Curriculum Vitae of Joel W. Hedgpeth.	308
K. Commencement Speech to Class of 1970, Fresno State College.	316

CHISPA

THE QUARTERLY OF THE TUOLUMNE COUNTY HISTORICAL SOCIETY

Vol. 29, No. 1

SONORA, CALIFORNIA 95370

JUL.-SEPT., 1989

A Boy's Life at Mather - 1921-22

Joel W. Hedgpeth's Memories

(*Hetch Hetchy Camps Part V*)

By Ted Wurm

JKE DYE'S "Hog Ranch," as we have seen, gave its name to a tiny settlement which for a time served as the entrance gate to Hetch Hetchy Valley. The valley itself, a smaller version of Yosemite, was about ten rough miles by horseback farther into the Sierra Nevada Range - a bone-wearying four-hour ride. Hog Ranch had at one time served as the outpost of a contingent of U.S. Army soldiers guarding Yosemite.

In the second decade of this century the Hog Ranch became an important locale in the dramatic Hetch Hetchy story, with City and County of San Francisco playing the lead role. Their first decision here was to drop the old name. "Hog Ranch" was inelegant, and they bestowed the name Mather in honor of the first head of the National Park Service. This would be an important stop on the City's new Hetch Hetchy Railroad as the last space before the damsite with room for sidings and for their major sawmill. By 1918 the one-time pork center had become a busy settlement, with railroad, post office, strings of cabins for the sawmill workers, the all-important cookhouse, a commissary, and the big sawmill with its ponds.

Hetch Hetchy Railroad trains hauling cement for construction at damsite seldom had business at Mather, but all seemed to stop here for a "break" because it was always chow time when the tired trainmen arrived and the cook was famous all up and down the line. There was also a daily local freight train picking up and delivering supplies and construction materials at all stations. And there were two passenger trains daily each way, but to reach the Bay Area the same day, a traveler had to catch the westward train at 4:10 a.m. The numbered "passenger" trains usually had a few freight cars coupled ahead of the coach, or they could be "MOTOR" trains, gasoline railcars that trainmen referred to as "track buses."

A small post office was maintained within the station building, undoubtedly manned by the station agent, whose "duties" also consisted of tending a large garden of petunias at the western end of the building, a much-appreciated spot of color in the evergreen forest. This was a cheery sight to ten-year-old Joel Hedgpeth and his mother, arriving by train in 1921 from Oakland, to join the head of the family, who was employed as the blacksmith at Mather sawmill.



—Courtesy Ted Wurm

Ten-year-old Joel W. Hedgpeth smoking coffee in a pipe of his own design.



—Courtesy Ted Wurm

Hog Ranch as it appeared in August 1915. So named because pioneer Ike Dye raised porkers earlier, it afterwards became a guard station for soldiers protecting the Yosemite National Park. The name of the area was changed to "Mather" when it became a vital link in the Hetch Hetchy Project.

CHISPA

Published Four Times Each Year

Founding Editor: Donald L Segerstrom

"CHISPA," the title of the quarterly publication of the Tuolumne County Historical Society, is a word of Spanish origin which enjoys a special association with the history of the area. Although it has a variety of meanings, ranging from "sparks" or "embers" to "cleverness" or "wit," locally it acquired an additional colloquial meaning as it was also used to describe any nugget or specimen of gold, and particularly one of great beauty or high radiance. The term was introduced to the diggings of Tuolumne County by pioneer miners from the State of Sonora, Mexico, and was quickly adopted into the vocabulary of the many nationalities who mined here.

EDITOR: CARLO M. DE FERRARI

PRODUCTION EDITOR: Frances Germain

EDITORIAL BOARD: Richard L. Dyer, Joan Gorsuch, Sharon Marovich, Jean McClish, Lyle Scott, Dolores Yesca, Nicolini, Mary Etta Segerstrom, Mary Grace Paquette

The Quarterly of the Tuolumne County Historical Society, Inc.

P. O. Box 575 - Sonora, CA 95370

All rights to republication are reserved. Permission to quote or use material herein should be obtained in writing. Well-researched articles concerning local history are welcomed. However, editors reserve the right to edit, accept or reject any articles or photographs submitted for publication. The editors are not responsible for the loss of, or failure to return any unsolicited article, articles or photographic materials.

Joel recalled in his "Tuolumne Memories" notes that they had waited a long time at Oakdale for the Sierra Railway connection, then camped a few days at Groveland and other places along the way. The family finally moved into a long, one-door cabin near the sawmill at Mather. "It was not long after that," he writes, "when I encountered an old gentleman with his burros, unpacking hymn books in the grove in preparation for services... When he found out who I was, he immediately looked up my mother, for they had been fellow missionaries." This was the Reverend Hugh Furneaux, in those days known as "The Shepherd of the Hills." He was a Presbyterian missionary working out of Columbia or Sonora during the summer months. "He traveled up and down the mountains on his mission, with his donkeys 'Pipe Organ' and 'Bagpipes.' She invited him to dinner, after which he baptised me as Joel Walker Hedgpeth. I am reminded that I may be the only person to have been baptised at Mather. [The date is not recorded unless] Mr. Furneaux registered the event somewhere in his records... in Columbia or Sonora.

"We returned the next summer (1922) and stayed



- Courtesy Ted Wurm

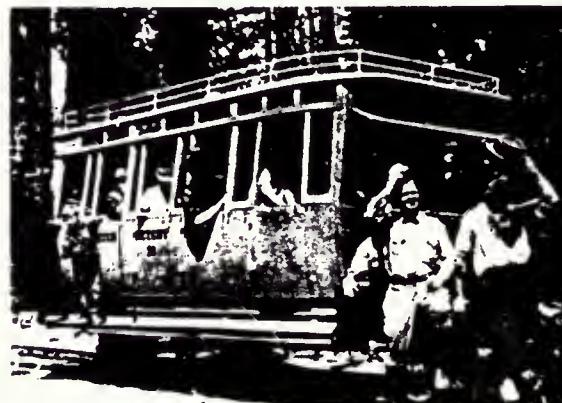
Mather's famous petunia patch located west of the Mather railroad station and post office.

for some weeks in a tent near the road not far from the Oakland Recreation Camp on Middle Fork. Mr. Furneaux had gone down to "The City" and left his burros with us... I rode one of them all over that country. That summer was when I found my father's I.W.W. (Industrial Workers of the World) card, a thick elegant affair with a screaming eagle clutching a red, white, and blue flag. There was quite a family scene about that and I never saw the card again. But I did learn a great deal about those independent donkeys.

"Mather was a lively place for me although I was the only small boy in residence then. There were always trains going back and forth (between Groveland and Damsite) and others from the shore line which came across the hill from Peach Growers Mill. [Their locomotive] was the first Shay I had seen and it sounded like an enormously oversized coffee grinder, frightening me at first, but I became fascinated by all the gears and pistons.

"Almost daily during the summer there were the excursion buses from Camp Curry, big, touring-car style, dusty green Pierce Arrows, conveying groups of people from Yosemite to Hetch Hetchy to observe the construction. They arrived at the lodge across the tracks for lunch. I soon learned that mingling with these people produced various tidbits from their box lunches, and they persuaded me to stand on a stump and sing songs for them. I wonder how many family albums have photos of me standing on a tree stump. I also discovered that if I learned some new bad words, the camp cook would give me a big piece of pie.

"It was a lovely summer. The meadow was growing high and I would walk across it smelling the Calochortus among the grass and going up the rocky side past the old [Hog Ranch] corral... I was in and out of every abandoned or unoccupied cabin in the vicinity, including some I should not have [investigated]... I found some dynamite caps in one shed and had a bad accident. I was lucky not to blow my head off [though the left hand was badly damaged]. The ride to Groveland from Mather in a box car "was one I never wanted to repeat. The train took many hours, with long stops at several places. It was evening before we got to the hospital at which I was to spend three weeks.



- Courtesy Ted Wurm

Arrival of a typical track tour bus at Mather in 1923. The lady standing on the rear step is Mrs. William Long with young William Pearson, Jr. Others are unidentified.

"The late Doctor John B. Degnan patched me up so that I had a functioning left hand. As I was recuperating and my wounds toughening up, we stayed around Groveland for several weeks. I often wandered into the saloon with its festoons of rattlesnake skins from the center light to the walls... at that time the bar was on the other side of the room and there was large fly trap in the middle... Except for the activity of the railroad, Groveland did not seem to be much of a place then. Abandoned mine shafts and empty places and other signs of past activity... The expression 'all mined out' was something I learned the meaning of then."

[When they were living at Mather] "I did not like the trip to the dam construction at Hetch Hetchy. Maybe it was all the noise of engines and cables and the raw, freshly-blasted rock and sawed-off trees... A lovely large pine tree, biggest within the camp, was cut down near our cabin [for no apparent reason] and as it fell on the slope it cracked, so a big piece was left behind. But bigger trees were being sawed up in the mill every day and my father worked in the mill... I am confused about the timing, but we did stay into the winter, and I remember the orders for winter supplies coming in... boxes of all sorts, soap to big bars of Ghirardelli chocolate, that were unpacked and stored away. And the snow!"

"I was sent off to Palo Alto Military Academy in February 1922, since I had already missed a half year of school. [The family returned to Oakland in 1922, but] "I was back in 1925 as a Boy Scout, staying at Dimond O Camp, the former Peach Growers area. We often used the old mill pond at Mather as a swimming pool. The mill was still there then, but the house in which we had lived had been hauled away." (Conclusion of Joel Hedgpeth's "Memories." Today, Dr. Hedgpeth is a world-renowned marine biologist, writer, lecturer, scholar, with headquarters at Santa Rosa.)

The sawmill of California Peach Growers was about one and a half miles south of Mather on the road to Carl Inn, Big Oak Flat Road, and Yosemite. Logs were brought to the two-band mill over several railroad spurs. Finished lumber was loaded and shipped out via Hetch Hetchy Railroad. There were about five carloads per day, mainly shook material for fruit boxes, during the cutting season for the whole time Hetch Hetchy operated as a common carrier railroad. Peach Growers also operated a subsidiary mill, run by Mr. Fascio, which shipped carloads of lumber out of Buck Meadows.

Merle Rodgers hired on at Mather sawmill in 1919. He remembered the big Peach Growers mill and watching their train of cut lumber arriving at



- TCHS Collection

Rev Hugh Furneaux, Presbyterian missionary "Shepherd of the Hills" with his two well-known traveling companions "Pipe Organ" and "Bagpipes." Rev. Furneaux baptized Joel Hedgpeth at Mather in 1921, and the following year his assistants educated young Hedgpeth in the nature of donkeys.

the interchange each evening. In the early 20s a young teenager, Del Gilliam, often visited his brother, who was railroad hostler for the Hetchy at Mather. They would run over to pick up Peach Growers loads at the interchange, and sometimes the Hetch Hetchy locomotive would venture all the way to the "PG Mill" to get their loaded cars. Things were quite informal in the mountains and an occasional improvisation was not criticized. During 1925 school vacation Gilliam rode a speeder on the railroad as fire patrol, 20 minutes behind steam locomotive No. 5 hauling lumber trains down the Hetchy tracks for Peach Growers. The latter had leased the 5-spot and a crew when Hetch Hetchy ceased common carrier service to Mather and the Damsite earlier that year.

O'Shaughnessy Dam was completed in 1923 and the rails removed back nine miles to Mather so the right of way could be converted to a highway under terms of the Raker Act. The sawmill was shut down, having turned out 21 million feet of lumber, and the City crews gradually converted the construction camp into the family summer camp that enlivens the area today. In 1948 the railroad was abandoned and all tracks removed. The old station/post office building remains beside the paved road that replaced railroad tracks. And Joel Hedgpeth writes that when he visited Camp Mather a few years ago, he noted that the fine pine tree, the one that had been cut down without reason near their cabin in 1921, was still lying around in sawed-up hunks. They had disappeared by 1988.



— Courtesy Ted Wurm

Peach Growers Sawmill in operation in May 1919.



— Courtesy Ted Wurm

Locomotive of the California Peach Growers, Inc., hauling logs to the operation's sawmill located a mile and a half south of Mather.

Sea Spiders (Pycnogonida)

Proceedings of a meeting held in honour of

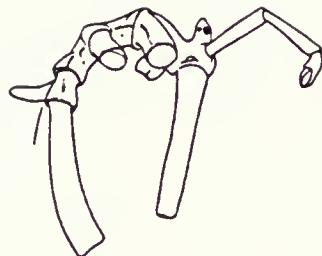
JOEL W. HEDGPETH

on 7 October 1976 in the Rooms of the
Linnean Society of London

Edited by

W. G. FRY

Zoological Journal of the Linnean Society, Vol. 63, Nos 1 and 2 (1978)
Published for the Linnean Society of London by Academic Press



Introduction

The pycnogonids are a small group of animals, of about 600 species, obscure to most biologists and given, at best, a superficial treatment in general and student texts. Yet, even the most cursory examination of a pycnogonid bibliography reveals the names of numerous biologists who have achieved eminence in other fields and whose imaginations have been captured by these unusual animals.

In some cases, the allure of pycnogonids has proved to be only a brief and youthful seduction. In other cases, sea spiders have provided a longer-lasting attraction to which distinguished zoologists have turned from time to time a diversion from their major intellectual involvements.

Joel Hedgpeth is a biologist of unquestionable distinction, most particularly well known in the field of marine ecology. In that field, his "Big Red Book"—as it is affectionately known, his editions of *Between Pacific Tides*, and his numerous incisive writings on a wide variety of ecological topics place him among one of the foremost marine biologists which this century has produced.

However, Joel Hedgpeth also occupies a unique position in the minds and affections of that relatively small group of people, scattered around the world, for whom pycnogonids are more than just an aberrant, scarcely seen form of marine arthropodan life. Despite his heavy engagement in the wider fields of marine ecology and despite the prohibitions of academic zoological fashion—described with characteristic penetrating and sometimes wry humour in *Taxonomy: Man's Oldest Profession*, he has provided over some thirty-five years a series of papers which occupy a central position in the corpus of pycnogonic literature.

That this is so is due, I think, to two phenomena. One is an unhappy accident of world and zoological history. The other is a most happy accident of inheritance and culture.

When, in the late 1930s, he was able to divert the major part of his research time to pycnogonids, the number of their investigators and chroniclers had dwindled to a small handful. V. Schimkewitsch, H. Helfer, E. Schlottke, W. T. Calman, J. C. C. Loman, L. Giltay, W. A. Hilton and E. L. Bouvier had published or were publishing their last papers; for L. K. Losina-Losinsky, L. Fage,

H. Oshima and K. Stephensen the war brought a temporary halt to their researches; I. Gordon had turned, as her duties demanded, from pycnogonids to the Crustacea. In the fifteen years after 1939 sea spiders did not receive more than a hundred mentions in print and, of the research papers which treated of them, nearly one half were written by Joel Hedgpeth.

It is the very highest quality in his writings, as well as the number of his publications in that period, which ensured a continuity of interest in and expansion of knowledge of the pycnogonids. In a very real sense Joel Hedgpeth carried the torch of pycnogonid studies through a dark time to kindle the enthusiasm of a new generation of biologists.

When, in 1953, I first encountered pycnogonids crawling on a trawl net pulled up from the North Atlantic and was curious about their forms and nature, there was readily available only *The Pycnogonida of the Western North Atlantic and the Caribbean*. That paper led, inevitably, to *On the Evolutionary Significance of the Pycnogonida*.

It was a shock to find that taxonomic writing could consist of such precise and scholarly prose and yet be shot through with charm and a sympathetic delight in the animals and in the human frailties which their past study had evoked. Read one of Joel Hedgpeth's papers and you will want to read them all.

This, then, is the happy accident of inheritance and culture; that pycnogonid studies were continued through a dark time by someone with a deep love of scholarship, the courage to show his enthusiasms, a deft skill in prose and a natural gift for graphic illustration.

I have made an attempt to illustrate that latter gift by placing a selection of drawings in the text of the volume. The drawings are in a variety of styles, but no matter what the style, by economy and grace of line each is rich in information and evident pleasure.

Every paper in this volume owes something to Joel Hedgpeth's work and some owe a great deal, for his writings have touched upon almost every aspect of pycnogonid biology. It would not be extravagant to claim that there is no serious student of the group who has not been influenced by his work, not merely through the practical necessity of studying his conclusions and data, but also by an encounter with that literary elegance and humour which is so rare in contemporary zoological literature. Perhaps the last word on this point should come from his friend of long standing, Dr Jerome Tichenor, who wrote of *Research Funding*:

*We must improve our image
To show how good we are:
For in the scientific scrimmage
We won't go very far
If our image is old fashioned
When the funds are being rationed.*

Joel Hedgpeth has now relinquished his university posts, but his wisdom in marine ecology and conservation places him in great demand all over America and Europe whenever governments acknowledge the conflict between industrial development and the conservation of marine environments. A

INTRODUCTION

vii

parochial, but nevertheless important, fear is that government agencies will now keep him so busy as to stifle his pycnogonid researches. That would be a sad day.

It was most fitting that a meeting to honour Joel Hedgpeth should have been held at the foremost British natural history society. He has long had a warm affection for Britain, and I am sure that he would not cavil at the suggestion that a major aim of his life has coincided with that aim described in the Society's Charter as "the cultivation of Natural History in all its branches".

The Society began its publication of articles on sea spiders in 1800. Recently, it has sponsored more and important publication on the group. It is appropriate, therefore, that this, the first symposium volume on the group, should be published under the Society's auspices.

The preparation of any multinational symposium is inevitably fraught with some difficulties. That they were minimal in this case was due in large measure to the eagerness with which the speakers and chairmen wished to gather to honour Joel Hedgpeth.

Many people assisted the organization. I thank the Society's President, Council and Officers for their encouragement and, more particularly, I proffer my thanks to the Executive Secretary and his staff for easing administrative difficulties. Grateful thanks are due also to the British Council for a grant of money towards the expenses of overseas speakers.

Editing any collection of papers, however slim, brings headaches. I thank Dr Humphry Greenwood and Dr Karen Hiemae for ensuring publication and I thank my wife for not merely tolerating the irritability engendered by editing, but for dispensing coffee and encouragement.

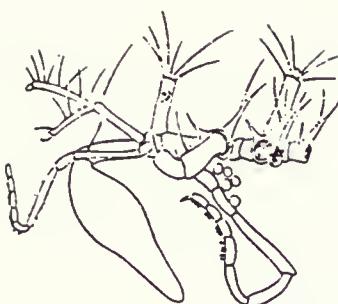
Mrs Pamela Vetchon did mountains of typing for me and I owe much to her efficiency and good humour throughout.

It may seem strange to acknowledge the assistance of the very person whom this volume honours, but his gentle comment that he was surprised to be working so hard for his own festschrift is the very best indication of how important is Joel Hedgpeth's position in pycnogonid biology.

Concerning publication, Dr Jerome Tichenor should, again, have the last word:

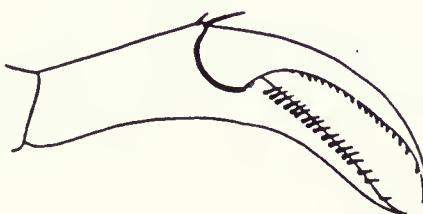
*We regret to inform the reader that
This book has been printed
With the aid of electricity.*

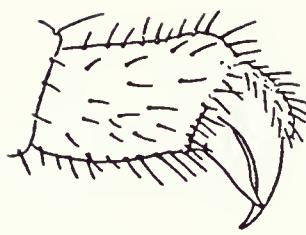
WILLIAM G. FRY,
Luton College,
Park Square,
Luton,
Bedfordshire.



Contents

Introduction	v
Contributors	x
MANTON, S. M. Habits, functional morphology and evolution of pycnogonids	1
HEDGPETH, JOEL W. A reappraisal of the Palaeopantopoda with description of a species from the Jurassic	23
FRY, WILLIAM G. A classification within the pycnogonids	35
STOCK, JAN H. Experiments on food preference and chemical sense in Pycnogonida	59
RICHARDS, PETER R. and FRY, WILLIAM G. Digestion in pycnogonids: a study of some polar forms	75
ARNAUD, FRANÇOISE. A new species of <i>Ascorhynchus</i> (Pycnogonida) found parasitic on an opisthobranchiate mollusc	99
JARVIS, J. H. and KING, P. E. Reproductive biology of British pycnogonids (oogenesis and the reproductive cycle)	105
CHILD, C. ALLAN. Gyandromorphs of the pycnogonid <i>Anoplodactylus portus</i>	133
SCHRAM, FREDERICK R. and HEDGPETH, JOEL W. Locomotory mechanisms in Antarctic pycnogonids	145
MORGAN, ELFED. The energy cost of off-shore migration in <i>Nymphon gracile</i> (Pycnogonida)	171
DE HARO, A. Ecological distribution of pycnogonids on the Catalan coast	181
FRY, WILLIAM G and STOCK, JAN H. A pycnogonid bibliography	197





Contributors

ARNAUD, F. *Station Marine d'Endoume, Rue de la Batterie-des-Lions, Marseille 13007, France* (p. 99)

CHILD, C. A. *Department of Invertebrate Zoology, Smithsonian Institution, Washington, D.C. 20560, U.S.A.* (p. 133)

DE HARO, A. *Departamento de Zoología, Facultad de Ciencias, Universidad Autónoma de Barcelona, Barcelona, Spain* (p. 181)

FRY, W. G. *Department of Science, Luton College, Park Square, Luton, Bedfordshire, U.K.* (pp. 35, 75, 197)

GORDON, I. 2 Heathview Gardens, London SW15 3SZ, U.K. (Chairman)

HUDGELTH, J. W. 5660 Montecito Avenue, Santa Rosa, California 95404, U.S.A. (pp. 23, 145)

KING, P. E. *Department of Zoology, University College of Swansea, Singleton Park, Swansea, U.K.* (p. 105)

JARVIS, J. H. Westerdijk 31R, te Hoorn, The Netherlands (p. 105)

MANTON, S. M. *Department of Zoology, British Museum (Natural History), Cromwell Road, London SW7 5BD, U.K.* (p. 1)

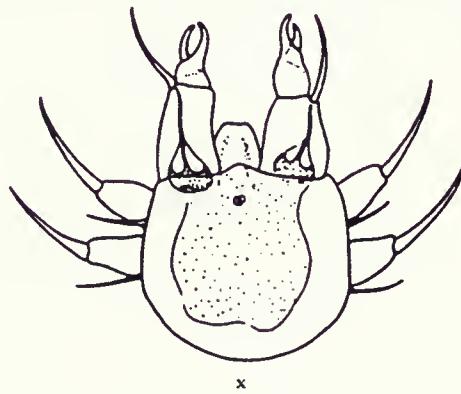
MORGAN, E. *Department of Zoology and Comparative Physiology, University of Birmingham, PO Box 363, Birmingham B15 2TT, U.K.* (p. 171)

RICHARDS, P. R. *Department of Mechanical Engineering, University of Surrey, Guildford, Surrey, U.K.* (p. 75)

SCHRAM, F. R. *Department of Zoology, Eastern Illinois University, Charleston, Illinois 61920, U.S.A.* (p. 145)

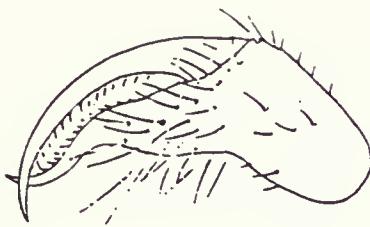
STOCK, J. H. *Instituut voor Taxonomische Zoologie, Zoölogische Museum, Plantage Middenlaan, Amsterdam, The Netherlands* (pp. 59, 197)

YONGE, C. M. 13 Cumin Place, Edinburgh EH9 2JX, U.K. (Chairman)



Zoological Journal of the Linnean Society, 63: 197-238

May/June 1978



A pycnogonid bibliography

WILLIAM G. FRY

Department of Science, Luton College, Park Square, Luton, Bedfordshire

AND

JAN H. STOCK

*Instituut voor Taxonomische Zoologie, Zoölogisch Museum,
Universiteit van Amsterdam, Amsterdam, The Netherlands*

KEY WORDS: -Pycnogonida -Pantopoda -all literature -authors -titles -journals -books -
co-authors -editors -translators -zoological -ecological.

CONTENTS

Introduction	197
Bibliography	199
Index of Joint Authors, Editors, Translators and Alternative Name-forms	235

INTRODUCTION

We have presumed to prepare a bibliography for the pycnogonids at this time for several reasons.

First, a special volume of articles on pycnogonids presents an ideal vehicle for such a contribution. Additionally we fear that, if left to grow for even a few more years, a pycnogonid bibliography could find no printed resting place except in a specialist bibliographic publication, where it would be inaccessible to many.

Furthermore we are delighted to display in this festschrift the rôle which Joel Hedgpeth has played in creating pycnogonid literature in the widest sense and in consolidating a firm literature base from which we and others could work. His own bibliographic work has been most important in furthering research on pycnogonid biology.

197

0024-4082/78/0063-0197/\$05.00/0

© 1978 The Linnean Society of London

Finally, now that historians of biology are beginning to attract more of the interest that they deserve, we should like to offer this contribution to them, in the hope that it may solve some minor problems and offer some profitable lines of enquiry. Because biology librarians are historians of science—inevitably it seems to us, we include them in this dedication.

That we do presume in offering this bibliography we are sure. We have aimed at completeness not only for all writings on pycnogonids *qua* pycnogonids but also for those treating pycnogonids solely as ecological data. Perhaps, by selecting more than one aim, we may have missed all targets. However, pycnogonids are creeping noticeably in larger numbers into physiology and ecology. We would like to hope that, with a basic synopsis of the literature available to them, nascent pycnogonologists will flourish.

Certain possible sources of error should be noted. These arose from the necessary attempt to give full journal titles. We have made extensive use of the List of Serial Publications in the British Museum (Natural History) Library and also of the *World List of Scientific Periodicals* (4th ed.). Unfortunately, neither of these publications is perfectly complete and neither discriminates consistently between plural and singular word endings. In addition, we have been unable to examine 5% of the publications cited. Pooling these inadequacies, it is clear that a small fraction of the publications may prove difficult to locate. However, we hope that we have not created any "ghost" journals.

Another problem arises from national differences in the use of capital letters for "important" words. In this context we have acted multinationally rather than internationally, as far as possible. However, to aid distinction between journal titles and book titles within a limited range of type-faces, we have capitalized all "important" words in the latter.

Finally, we regret the necessity for transliteration from the Cyrillic alphabet. Inevitably, despite the brave attempts of the British Standards Institute (No. 2979: 1958), and Royal Society publications, this produces some barbarisms.

Many people have assisted us in this enterprise. In particular, we thank Mr Gavin Bridson, who helped to turn many corrupted abbreviations into sense in their proper languages and to track down some of the more obscure articles. Joel Hedgpeth most kindly compared an early draft of the manuscript with his extensive files and corrected a number of errors and omissions. Mrs Pamela Vachon was a most efficient and helpful typist for us, turning heaps of scrawled cards into legible texts. Our thanks are also due to Mrs Patricia Fry, who helped to keep under control the great interlinear palimpsest whose growth rate at times threatened the whole enterprise.

Despite all this assistance we fear that errors and omissions remain. For these we are to blame. We also take responsibility for those personal interpretations which may not please everyone.

A PYCNOGONID BIBLIOGRAPHY

211

HALLEZ, P., 1905a. VII. Notes fauniques. *Archives de Zoologie Expérimentale et Générale*, (4) 3 (Notes & Revue, 3): xlvi-lii. [Sometimes cited problematically as Dantan (1905).]

HALLEZ, P., 1905b. Observations sur le parasitisme des larves de *Phoxichilidium* chez Bougainvillea. *Archives de Zoologie Expérimentale et Générale*, (4) 3: 133-144; VI.

HAMOND, R., 1963. A preliminary report on the marine fauna of the North Norfolk coast. *Transactions of the Norfolk & Norwich Naturalists' Society*, 20 (1): 1-31; 1-4.

HANSEN, H. J., 1884a. Fortegnelse over hidtil i de danske Have fundne Pycnogonider eller Sospindler. *Naturhistorisk Tidsskrift, Kjøbenhavn*, (3) 14: 647-652. [?].

HANSEN, H. J., 1884b. Spindeldyr (Pantopoda eller Pycnogonidae). In *Zoologia Danica Afbildninger af danske Dyr med popularer Text*, 4: 117-131; VII. Copenhagen. [= 1885.]

HANSEN, H. J., 1886. Vorläufige Mitteilung über Pycnogoniden und Crustaceen aus dem nördlichen Eismeer, von der Dijmphna-Expedition mitgebracht. *Zoologische Anzeiger*, 9: 638-643.

HANSEN, H. J., 1887. Kara Havets Pycnogonider. In *Dijmphna-Togtets zoologisk-botaniske Udbyrte*: 157-181; XVIII, XIX. Kjøbenhavn: Bianco Lunos.

HANSEN, H. J., 1895. Pycnogonider og Malacostrake Krebsdyr. *Meddelelser om Grønland*, 19: 123-125.

HANSEN, H. J., 1930. *Studies on Arthropoda*, 3: 333-335. Copenhagen.

HANSEN, H. J. & SØRENSEN, W., 1898. The order Palpigradi Thor. and its relationship to the other Arachnida. *Entomologiska Tidsskrift*, 18 (3-4): 223-240; IV.

HANSTRÖM, B., 1919. Zur Kenntnis des zentralen Nervensystems der Arachnoiden und Pantopoden nebst Schlussfolgerungen betreffs der Phylogenie der genannten Gruppen. *Inaugural Dissertation, University of Lund*. 1-191; 66 figs.

HANSTRÖM, B., 1926. Eine genetische Studie über die Augen und Schzentren von Tubellarien, Anneliden und Arthropoden. *Kungliga Svenska Vetenskaps Akademien's Handlingar*, Stockholm, (3) 4: ? pp.

HANSTRÖM, B., 1927. Neue Beobachtungen über Augen und Schzentren von Entomostracen, Schizopoden und Pantopoden. *Zoologische Anzeiger*, 70: 236-251; 7 figs.

HANSTRÖM, B., 1965. Indications of neurosecretion and the structure of Sakolow's organ in pycnogonids. *Sarsia*, 18: 24-36.

HASWELL, W. A., 1885. Pycnogonida of the Australian coast with descriptions of new species. *Proceedings of the Linnean Society of New South Wales*, 9: 1021-1033; LIV-LVII.

HEDGPETH, J. W., 1939. Some pycnogonids found off the coast of Southern California. *The American Midland Naturalist*, 22 (2): 458-465. 2 pls.

HEDGPETH, J. W., 1940. A new pycnogonid from Pescadero, Calif., and distributional notes on other species. *Journal of the Washington Academy of Sciences*, 30 (2): 84-87; 1 fig.

HEDGPETH, J. W., 1941a. On a species of *Nymphon* from the waters of Southern California. *The American Midland Naturalist*, 25 (2): 447-449; 1 pl.

HEDGPETH, J. W., 1941b. A key to the Pycnogonida of the Pacific coast of North America. *Transactions of the San Diego Society for Natural History*, 9 (26): 253-264; IX-XI.

HEDGPETH, J. W., 1941c. A key to the pycnogonids of the Pacific coast of North America (especially of central California). In S. F. Light (Ed.), *Laboratory and Field Texts in Invertebrate Zoology*: 119-124; 99-105. Berkeley & Los Angeles: University of California Press.

HEDGPETH, J. W., 1942. Sea spiders. *Nature Magazine*, [?]: 413-414; 4 figs.

HEDGPETH, J. W., 1943a. Pycnogonids of the Bartlett collections. *Journal of the Washington Academy of Sciences*, 33 (3): 83-90; 2 figs.

HEDGPETH, J. W., 1943b. Pycnogonida from the West Indies and South America collected by the *Albatross* and earlier expeditions. *Proceedings of the New England Zoological Club*, 22: 41-58; VIII-X.

HEDGPETH, J. W., 1943c. On a species of pycnogonid from the North Pacific. *Journal of the Washington Academy of Sciences*, 33 (7): 223-224; 1 fig.

HEDGPETH, J. W., 1944. On a new species of *Pallenopsis* (Pycnogonida) from Western Australia. *Proceedings of the New England Zoological Club*, 23: 55-58; XI-XII.

HEDGPETH, J. W., 1947a. Pycnogonida. *Encyclopaedia Britannica*: 2 pp.; 2 figs.

HEDGPETH, J. W., 1947b. On the evolutionary significance of the Pycnogonida. *Smithsonian Miscellaneous Collections*, 106 (18): 1-54; 1, 16 figs.

HEDGPETH, J. W., 1948. The Pycnogonida of the western North Atlantic and the Caribbean. *Proceedings of the United States National Museum*, 97 (3216): 157-342; 4-53, 3 charts.

HEDGPETH, J. W., 1949. Report on the Pycnogonida collected by the Albatross in Japanese waters in 1900 and 1906. *Proceedings of the United States National Museum*, 98 (3231): 233-321; 18-51.

HEDGPETH, J. W., 1950. Pycnogonida of the United States Navy Expedition, 1947-48. *Proceedings of the United States National Museum*, 100 (3260): 147-160; 17-19.

HEDGPETH, J. W., 1951. Pycnogonids from Dillon Beach and vicinity, California, with descriptions of two new species. *The Wasmann Journal of Biology*, 9 (1): 105-117; 3 pls.

HEDGPETH, J. W., 1952. Class (or Subphylum) Pycnogonida. Sea Spiders. In E. F. Ricketts & J. Calvin (Eds), *Between Pacific Tides*, 3rd ed.: 430. Stanford: Stanford University Press.

HEDGPETH, J. W., 1954a. Class Pycnogonida. In R. I. Smith et al. (Eds), *Intertidal Invertebrates of the Central California coast*: 201-210; 91-96. Berkeley & Los Angeles: University of California Press.

HEDGPETH, J. W., 1954b. Pycnogonida. In P. S. Gallo (Ed.), *The Gulf of Mexico, its origin, waters*

and marine life. *Fishery Bulletin of the Fish & Wildlife Service of the United States*, 89 (55): 425-427; 69.

HEDGPETH, J. W., 1954c. On the phylogeny of the Pycnogonida. *Acta Zoologica, Stockholm*, 35: 193-213; 9 figs.

HEDGPETH, J. W., 1954d. 1. The Pycnogonida. Reports on the dredging results of the Scripps Institution of Oceanography Trans-Pacific Expedition, July-December, 1953. *Systematic Zoology*, 3 (4): 147.

HEDGPETH, J. W., 1955a. Pycnogonida. In R. C. Moore (Ed.), *Treatise on Invertebrate Palaeontology, (P) Arthropoda*, 2: 163-170; 117-122. New York: Geological Society of America.

HEDGPETH, J. W., 1955b. *Palaeosopus*. In R. C. Moore (Ed.), *Treatise on Invertebrate Palaeontology, (P) Arthropoda*, 2: 171-173; 123. New York: Geological Society of America.

HEDGPETH, J. W., 1956. On the phylogeny of the Pycnogonida. *Proceedings of the XIVth International Congress of Zoology, Copenhagen, 1953, Section XV*: 506-507.

HEDGPETH, J. W., 1957. Miscellaneous arthropods—annotated bibliography. In J. W. Hedgpeth (Ed.), *Treatise on Marine Ecology and Paleoecology, I. Ecology*: 1175-1176. Geological Society of America, Memoir, 67. Boulder: Geological Society of America.

HEDGPETH, J. W., 1959. Pycnogonida. In *Encyclopaedia Britannica*: 2 pp.; 2 figs.

HEDGPETH, J. W., 1961a. Pycnogonida. In *Encyclopedia of Science and Technology*: 105-106; 3 figs. New York: McGraw Hill.

HEDGPETH, J. W., 1961b. Pycnogonida. In *The Encyclopedia of the Biological Sciences*: 851-852. New York: Van Nostrand Reinhold.

HEDGPETH, J. W., 1961c. Pycnogonida. Reports of the Lund University Chile Expedition 1948-49. *Lunds Universitets Årskrift*, N.F. (2) 57 (3): 1-18; 1-11.

HEDGPETH, J. W., 1962a. A bathypelagic pycnogonid. *Deep-Sea Research*, 9: 487-491; 1-2.

HEDGPETH, J. W., 1962b. Taxonomy: Man's oldest profession. *11th Annual University of the Pacific Faculty Research Lecture, May 22, 1961*: i + 18 pp.; 2 figs.

HEDGPETH, J. W., 1962c. Pycnogonida. In *Introduction to Seashore Life of the San Francisco Bay Region and the Coast of Northern California*: 74-75; VI, 2 figs. Berkeley & Los Angeles: University of California Press.

HEDGPETH, J. W., 1963. Pycnogonida of the North American Arctic. *Journal of the Fisheries Research Board of Canada*, 20 (5): 1315-1348; 1-12.

HEDGPETH, J. W., 1964. Notes on the peculiar egg laying habit of an antarctic prosobranch (Mollusca: Gastropoda). *The Veliger*, 7 (1): 45-46; 1 fig.

HEDGPETH, J. W., 1967. Review of Basic Arthropodan Stock. *Quarterly Review of Biology*, 42: 69-*Biology*, 42: 69.

HEDGPETH, J. W., 1968a. Pycnogonid studies. *Antarctic Journal of the United States*, 3 (4): 129-130; 2 figs.

HEDGPETH, J. W., 1968b. Pycnogonids. In E. F. Ricketts & J. Calvin. *Between Pacific Tides*: 78, 102-104, 157, 170, 186, 188, 202, 316-317, 349, 351-352, 366-368, 477-479, 157, 256. (4th ed., rev. J. W. Hedgpeth). Stanford: Stanford University Press.

HEDGPETH, J. W., 1969a. Introduction to Antarctic Zoogeography. *Antarctic Map Folio Series of the American Geographical Society*, Folio 11: 1-7; 15 figs.

HEDGPETH, J. W., 1969b. Pycnogonida. *Antarctic Map Folio Series of the American Geographical Society*, Folio 11: 26-28, pls 13, 14.

HEDGPETH, J. W., 1969c. Pycnogonida. In P. Gray (Ed.), *Encyclopedia of the Biological Sciences*: 780-781; 3 figs. New York: Van Nostrand Reinhold.

HEDGPETH, J. W., 1969d. An intertidal reconnaissance of rocky shores of the Galapagos. *The Wasmann Journal of Biology*, 27 (1): 1-24.

HEDGPETH, J. W., 1969e. Preliminary observations of life between tidemarks at Palmer Station, 64°45'S, 64°05'W. *Antarctic Journal of the United States*, 4 (4): 106-107.

HEDGPETH, J. W., 1970. Marine biogeography of the Antarctic regions. In M. W. Holdgate (Ed.), *Antarctic Ecology*: 97-104. 1 fig. Scientific Committee for Antarctic Research. London & New York: Academic Press.

HEDGPETH, J. W., 1971a. Subphylum Pycnogonida, Class Pantopoda. Sea Spiders. In K. L. Gosner, *Guide to Identification of marine and estuarine invertebrates—Cape Hatteras to the Bay of Fundy*: 400-402; 20-22. New York: Wiley Interscience.

HEDGPETH, J. W., 1971b. James Eights of the Antarctic. In, *Research in the Antarctic*. American Association for the Advancement of Science.

HEDGPETH, J. W., 1971c. Perspective of benthic ecology in Antarctica. In *Research in the Antarctic*: 93-136; 1-19. American Association for the Advancement of Science.

HEDGPETH, J. W., 1974a. One hundred years of Pacific Oceanography. In *The Biology of the Oceanic Pacific*: 137-155; 1-7. Oregon State University Press.

HEDGPETH, J. W., 1974b. Phylum Arthropoda. Subphylum Chelicerata. Class Pycnogonida. In E. N. Kozloff (Ed.), *Keys to the Marine Invertebrates of the Puget Sound, the San Juan Archipelago, and Adjacent Regions*: 125-128. Seattle: University of Washington Press.

A PYCNOGONID BIBLIOGRAPHY

213

HEDGPETH, J. W., 1974c. Review of *Pycnogonids*. *Science*, 184: 150.

HEDGPETH, J. W., 1975a. Pycnogonida. In S. F. Light (revised R. I. Smith & J. T. Carlton), *Intertidal Invertebrates of the Central California Coast*. Berkeley: University of California Press.

HEDGPETH, J. W., 1975b. Review of *Pycnogonids* and of *British Sea Spiders*. *Quarterly Review of Biology*, 50 (3): 330-331.

HEDGPETH, J. W., 1977a. *Paleoisopus*. In *McGraw Hill Encyclopedia of Science and Technology*, 9: 561.

HEDGPETH, J. W., 1977b. Pycnogonida. In *McGraw Hill Encyclopedia of Science and Technology*, 11: 110-112; 3 figs.

HEDGPETH, J. W., in press. At sea with provinces and plates. In *Biogeography: Biology Colloquium*. Oregon State University Press.

HEDGPETH, J. W., 1978. A reappraisal of the Palaeopantopoda with description of a species from the Jurassic. In, *Sea Spiders (Pycnogonida)*. *Zoological Journal of the Linnean Society of London*, 63 (1+2): 23-24; 1-11; 1-4.

HEDGPETH, J. W. & FRY, W. G., 1964. Another dodecopodous pycnogonid. *Annals and Magazine of Natural History*, (13) 7: 161-169; 3 figs.

HEDGPETH, J. W. & HADERLIE, E. C., 1978? Pycnogonids. In R. Morris, D. P. Abbott & E. C. Haderlie, *Invertebrates of California Shores* (?). Stanford: Stanford University Press.

HEDGPETH, J. W. & MCCAIN, J. C., 1971. A review of the pycnogonid genus *Pantoplietta* (family Austrodecididae, emend.) with the description of a new species. In G. Llano & I. E. Wallen (Eds), *Biology of the Antarctic Seas*, 4. *Antarctic Research Series*, 17: 217-229; 6 figs.

HEEZEN, B. C. & HOLLISTER, C. D., 1971. Pycnogonida. In *The Face of the Deep*: 8. 28, 92-94, 98-100, 121, 2.74-2.76. New York: Oxford University Press.

HEGNER, R. W. & STILES, K. A., 1959. Subclass Pycnogonida. In *College Zoology*: 268, 279; 1 fig. New York: Macmillan.

HELPFER, II., 1909. Biologisch-faunistische Beobachtungen an Pantopoden der Nord- und Ostsee. *Inaugural-Dissertation Kgl. Christian-Albrechts Universität zu Kiel*: 1-49; 11 figs, 1 map.

HELPFER, II., 1915. Pantopoda. In C. A. Apstein (Ed.), *Nomina conservanda. Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin*, 5. 147.

HELPFER, II., 1932a. Pantopoda. *Kükenthal-Krumbach, Handbuch der Zoologie*, 3 (2) (4): 1-66; 52 figs.

HELPFER, II., 1932b. Pantopoda; Nachtrag: Ferdinand Broili's Entdeckungen fossiler Pantopoden. In *Kükenthal-Krumbach, Handbuch der Zoologie*, 3 (2) (5): 67-72; 3 figs.

HELPFER, II., 1932c. Das Pantopoden-Schriftrum. *Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin*: 235-254.

HELPFER, II., 1935. Meeresspinnen. *Der Naturforscher* [?]

HELPFER, II., 1936a. The fishery grounds near Alexandria (Egypt). VIII. Pantopoda. *Ministry of Commerce & Industry, Egypt, Notes & Memoirs*, No. 16: 1-6, 3 figs.

HELPFER, II., 1936b. Pantopoda. *Die Tierwelt Nord- und Ostsee*, 31 (Xla3). 1-5; 1-map.

HELPFER, II., 1938. Einige neue Pantopoden aus der Sammlung des Zoologischen Museums in Berlin. *Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin*, 1937 (2): 162-185; 11 figs.

HELPFER, II. & SCHILOTTKE, E., 1935. Pantopoda. *Dr. II. G. Bronns Klassen und Ordnungen des Tierreichs*, 5 (4) (2): 1-314; 223 figs.

HELLER, C., 1875a. Neue Crustaceen und Pycnogoniden. Gesammelt während der K. K. österr.-ungar. Nordpol-Expedition. Vorläufige Mitteilung. *Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe der K. K. Akademie der Wissenschaften*, Wien, 71 (1): 609-612.

HELLER, C., 1875b. Die Crustaceen, Pycnogoniden und Tunicaten der K. K. österr.-ungar. Nordpol-Expedition. *Denkschriften der Kaiserlichen Akademie der Wissenschaften (Mathematisch-Naturwissenschaftliche Classe)*, Wien, 35: 25-46; I-V.

HENDERSON, J. R., 1885. Recent additions to the invertebrate fauna of the Firth of Forth. *Proceedings of the Royal Society of Edinburgh*, 8: 307-313.

HENRY, L. M., 1953. The nervous system of the Pycnogonida. *Microentomology*, 18 (1): 16-36; 15 figs.

HERDMAN, W. A., 1896a. List of Pycnogonida. In, *The marine zoology, botany and geology of the Irish Sea. Fourth and final report of the Committee . . . Report of the 66th Meeting of the British Association for the Advancement of Science*: 442.

HERDMAN, W. A., 1896b. Pycnogonida. In *9th Annual Report of the Liverpool Marine Biological Committee*: 19, 21, 24.

HERDMAN, W. A., 1901. Fourteenth annual report of the Liverpool Marine Biological Committee and their Biological Station at Port Erin. *Proceedings & Transactions of the Liverpool Biological Society*, 15 (1900-1901): 19-84; I-VII.

HERDMAN, W. A., 1903. The Marine Biological Station at Port Erin. *17th Annual Report of the Liverpool Marine Biology Committee*: 5-32. [Sometimes cited as CHADWICK, H. C., 1903.]

HERDMAN, W. A., THOMPSON, I. C. & CHADWICK, H. C., 1900. Fauna distribution lists for the south end of the Isle of Man. *14th Report of the Marine Biological Station at Port Erin*: 36.

HESSE, M., 1867. Observations sur des Crustacés rares ou nouveaux des côtes de France. *Annales des Sciences Naturelles, Paris*, (5) 7: 199-216; IV, 1, 9.

Ed Ricketts (1897-1948)

Marine Biologist

Joel W. Hedgpeth

La Jolla is something of a Mecca for marine biologists, not only because of Scripps, but also because of its unique collection of marine life: it was here that Ed Ricketts, the man on whom John Steinbeck based his immortal "Doc," came to collect the specimens that kept his ricketty laboratory in business and Cannery Row in beer.

Stephanie Pain, *New Scientist*, 18 Sept 1986

Ever since John Steinbeck metamorphosed his friend Ed Ricketts into "Doc" and stuffed him into *Cannery Row*, that "poisoned cream puff" (as one critic called it), too many readers have gotten the idea that a person becomes a marine biologist by just being one, without really doing much of anything except guzzling beer. Ed would have accepted this misconception with his usual good humor, but since the above description of Ed as a resident eccentric of a "ricketty lab" impugns his professional status as a collector of specimens for research and classroom study, he would probably have demanded an apology: he knew perfectly well that collecting in a marine laboratory's area has always been against the rules. Today, when the shores near Scripps are protected, he would have had grounds to sue for libel. At the very least, the description that lends "local color" to an otherwise authoritative British journal, is inaccurate—not the least slip being the several hundred miles between the "ricketty lab" (what a pun from Ms. Pain!) at Pacific Grove and Scripps Institution at La Jolla.

Just what is a marine biologist? What do marine biologists do?

During the years that Ed Ricketts thrived on the Monterey peninsula, many students at the Hopkins Marine Station knew him and learned from him as an informal adjunct faculty member, especially after the publica-

tion of *Between Pacific Tides* in 1939. He freely made available his unpublished papers on intertidal zones and wave shock to both faculty and students at Hopkins, as well as to visitors from other parts of the world. He was, in short, a part of the local scene, a man respected as a learned and qualified marine biologist in the best sense: a scientist who studies animals and their relations to each other, as well as to the physical environment in which they live.

Ed did not reach this stage of knowledge overnight. He had very little appropriate training. As a boy raised in Chicago, Ed had little experience with nature except a year in South Dakota. He probably visited the Field Museum, in those days a gathering of bones, stuffed animals and dusty seashells in cases. He transferred to the University of Chicago from Illinois State Normal, where he had taken courses in zoology and psychology. At Chicago, his college record was undistinguished, but he flunked no courses, although he was docked three grade points for persistent absence from chapel. When he was a student during the 1920s, there was no such thing as a major in marine biology. There was, however, the ecology course taught by W.C. Allee, who for several years had been conducting a field course at Woods Hole and compiling observations on the changes in the fauna of the region. Ed came away from the University with memories of Allee's course—Allee remembered him as one of "a group of Ishmaelites"—and of Dr. Libbie Hyman's stories of the fantastically rich fauna and flora of the Monterey coast that had to be seen to be believed (those were the days before precision lenses and color slides). Allee, who, like Dr. Hyman, had visited Hopkins, thought the abundance of life on the shore "appalling."

Without graduating, Ed left the University of Chicago to establish a biological supply business at

Appendix C
The Steinbeck Newsletter
Vol. 9, No. 1, Fall 1995.

Marine Biologist

Continued from page 17

Monterey. The idea to start the business had come from another student, A.E. Galigher, with whom he had shared living quarters. The Pacific coast of those days was not like Woods Hole, where classes and research since 1870s had established a sound base of known animals and plants. On the Monterey coast most invertebrates had yet to be described in monographs, and the only general work, Johnson & Snook's *Seashore Animals of the Pacific Coast*, was not to be available until 1927, five years after Ed arrived. He was thus confronted by a new and largely unstudied fauna, and he had to set about learning something about them, which meant careful collecting, labeling, and if necessary shipping to the National Museum in Washington for identification and description. The result of this activity is evidenced in the impressive number of obscure animals bearing the name *rickettsi*. This work stirred in him an interest to know more, and he spent long hours building up information in libraries and talking to people at Hopkins or Berkeley in order to set up an extensive interlocked index file on various sizes and colors of cards. None of this professionalism shows in *Cannery Row* (or in the unfortunate movie of that name) or in John Steinbeck's profile, "About Ed Ricketts." Yet all these activities, as well as the painfully worked-up graphs of tidal levels, are as much the stuff of marine biology as is walking on the seashore "in reverent contemplation of living things" or trying not to get seasick on a whale watching cruise.

And of course, and not least important, Ed as marine biologist wrote about things seen and experienced and speculated about. In this he was influenced by W.C. Allee's *Animal Aggregations*, published in 1931 and thereafter always in Ed's library as one of his honored and often-consulted books. He read biological journals with a keen eye; he noted, for example, a reference to a man named Cabrera (in Argentina) who articulated a law of ecological incompatibility: "In the same... locality, directly related animal forms

always occupy different habitats or ecological stations." Ed recognized this generalization as a fundamental ecological statement at least twenty years before it became accepted by theoretical ecologists.

But however accomplished as a marine biologist, Ed was sometimes hurt by a lack of degrees. An uncomprehending reader for the Stanford University Press, to whom ecology meant only temperature and pH, recommended against the proposed preface for the first edition of *Between Pacific Tides*, and science was held back twenty five years.

There is, of course, much more to marine biology: we bring ourselves to these studies. To borrow an expression from an eminent writer on environment ethics, Holmes Rolston, in *Philosophy Gone Wild* (1986): "To come alone to this [seashore] is to travel into an isolation that no one could support if he did not bring with him, like a carapace, the whole weight of his culture."

In the frame of this metaphor, Ed fits like some bright, exotic littoral crustacean, sometimes gaudy and elusive like the Sally Lightfoot, sometimes brooding. This quotation of Rolston has a distinctly Thoreauvian tone, and for what it is worth, Ed's tippy toe mouse dance was a maneuver not unlike Henry David Thoreau's dance, when he was seen "spinning airily around, displaying most remarkable lightness and agility" (Walter Harding). Thoreau himself brought with him wherever he went a remarkably varied carapace. Indeed, there was a strong flavor of Zen in both lives; both followed the "watercourse way" of Alan Watts, literally stated by Ed: "If you are caught in the current, don't fight it, but drift with it." As stated of Alan Watts, Ed was "a true human... not a model of righteousness, a prig or a prude, but [one who] recognized that some failings are as necessary to genuine human nature as salt to stew." Some people have labored too long over the mundane implications of this view of life in reference to Ed, forgetting that above all he was a student of life, especially on the seashore, and that his highest ambition was to write "good and true manuals" about marine invertebrates,

and that his idea of heaven was to be on a rich shore on a good low tide. Ed was a man who once wrote on the title page of one of his many notebooks, "all the good, kind, sane little animals."

All marine biologists hope to see coral reefs at least once in their lives, but Ed never did. The great adventure of his life was traveling to the Gulf of California, to the "Sea of Cortez," financed for him by John Steinbeck. He made the most of it, both in observing the collecting, and in writing up the findings. In record time he got the specimens out to the authorities so that he had the names that were essential, and he wrote the technical appendix that to him was a significant part of the book. He kept a journal, which Steinbeck did not, and contributed one of his famous philosophical essays that became the Earth Sunday chapter of the book. Many critics were confused and puzzled by the book, but at least Joe Campbell understood it and that was enough. The trip was Ed's experience with strange, awesomely empty landscapes and a sea teeming with creatures he had never seen before. As a project with John Steinbeck, *Sea of Cortez* gave Ed hopes for more, eventually a voyage beyond the northern latitude. He hoped first to finish part of his trilogy of books about the Pacific Coast, and he was well on with the northern part of it, to the Queen Charlotte Islands. But it was not to be. He met his fatal accident in the middle of preparations for the northern trip. And so it was left to others to write books about Coral Reefs; *Between Pacific Tides* remains as a worthy monument to a unique and devoted marine biologist.

Joel Hedgpeth gave a longer version of this lecture at the first annual Ricketts Memorial Lecture in Monterey, 15 November 1986.



Logo, Pacific Biological Laboratories.

THE UNIVERSITY OF WISCONSIN
COLLEGE OF AGRICULTURE

DEPARTMENT OF WILDLIFE MANAGEMENT

Madison 6
November 29, 1947.

424 UNIVERSITY FARM PLACE

Joel W. Hedgepeth
Texas Game, Fish and Oyster Commission
Austin, Texas

Dear Mr. Hedgepeth,

I pricked up my ears when you came out on "progress" in the American Scientist, but your "Man Against the Land" has now brought me to full attention. I am pleased that this is the fore runner of a book. Please do not let anybody talk you into a discreet silence. Keep right on writing at any cost.

When you get through with California, please do Texas.

Yours sincerely,

Aldo Leopold

Aldo Leopold

P.S. Do you have reprints? If so, please send one to Starker Leopold, Museum of Vertebrate Zoology, Berkeley; and one to me.

PROGRESS—THE FLOWER OF THE POPPY

By JOEL W. HEDGPETH

Texas Game, Fish, and Oyster Commission

According to an article which appeared in this journal not long ago, "Progress is the greatest thing there is; progress is going forward."¹¹ The fallacy of this statement is the assumption that there is such a thing as progress to begin with, and further, if it does exist, that it is good for man's well being in the environment to which he has become accustomed by ages of adaptive change. It may be protested that such adaptive change is progress *per se*, but this would be an argument *ex post facto*, and one does not have to be a philosopher to realize the difficulties of arguing after the fact.

Such difficulties are especially apparent in arguments in defense of progress when warfare must be defended as an instrument of progress. Without gunpowder, "development of the United States and the civilization of the world would have been set back centuries" (*loc. cit.*). And if we had had only rifles to fight the Japanese with, we would have been in very bad trouble: "Imagine our troops conquering seventy million fanatical Japanese with nothing but the rifle" (*ibid.*). When one looks over this continent with a reflective eye, it is saddening to think that only gunpowder stood between its unspoiled wilderness and artificial civilization. As for fighting the Japanese with rifles, one is tempted to ask, where did they learn about modern arms, battleships and the like?

Probably the most outrageous statement concerning the relation of war-

fare to progress is to be found in a recent book, *The Theory of Economic Progress*: "It has been said that wars are increasing in frequency throughout modern times, but in that case they must have been decreasing in violence—appearances to the contrary notwithstanding—since throughout the same period population has unquestionably increased."¹² Master Pangloss could not have said it better! Such reasoning indicates that progress is essentially a doctrine of optimism, that same naive faith that all is for the best in this best of all possible worlds which so outraged Voltaire's rational mind. Progress is the flower of the poppy: a pretty thing admired by those innocent of the soporific drug in the plant. One is tempted to paraphrase Lenin and call progress the opiate of the intellectuals. There are, of course, several varieties of the idea of progress. As J. B. Bury has shown in his classic treatise on the subject, the idea of progress is relatively new in history. As a concept applicable to history, it dates from the middle of the 18th Century, and is essentially a French idea, which found especial favor among the intellectuals of the Revolution, who regarded their times as a shining example of economic progress and the advance of general felicity among men. The application of the idea of progress to social change did not receive widespread attention until less than a hundred years ago, when the writings of Auguste Comte and John Stuart Mill reinforced the

concept, and the idea that history was subject to general laws, in the words of Mill, "passed into the domain of newspaper and ordinary political discussion." With the publication of the *Origin of Species* in 1857, a new twist was given to the idea of progress, and we are indebted principally to Herbert Spencer for the concept of evolutionary progress. In our own day, the most ardent exponent of the doctrine of evolutionary progress is Julian Huxley, described by some literary critic or another as "the most useful living member of the Huxley family."

Progress, as the concept is now generally entertained, is essentially a pernicious doctrine. It is a euphemistic synonym for change, in the sense of change for the better. As a word in the language, it means going somewhere, and is equally applicable to the study of arithmetic, a journey, Christian's long approach to the Celestial City, or the descent of Hogarth's rake to a less felicitous placeru. As a philosophical concept or an article of faith, it is, in the words of Aldous Huxley, "based on the wishful dream that one can get something for nothing. Its underlying assumption is that gains in one field do not have to be paid for by losses in other fields" (1). When spelled with a capital letter by politicians and advertising agencies, Progress is a specious excuse for the continued rape of the natural environment in behalf of maintaining and increasing our material civilization.

Sooner or later, every thoughtful person who considers this aspect of material progress of ours are already dangerously low. Must we continue many of those most essential to this until the land is exhausted, until our forests are no more and every river is dammed, and our cities are even greater fester on the social organism

understanding of that environment, but have enmeshed us in an economic tangle of our own making. Perhaps it is impossible to estimate how much of the dilemma in which we find ourselves is the result of over-exploitation of nature and our efforts to frustrate our environment, but it is certainly not the least of the causes of our troubles (2).

The theory that the solution of our dilemma of civilization lies in adding further complexities to our life is a true counsel of despair. It is admitted that the treatment has not been good for us, but that we can be cured by stronger doses of the same. We have estranged ourselves from nature. Very well, let us disown the old lady altogether, let us deny that we are sons of hers and proclaim our complete independence. Let us then sing a song of Progress, shining with electric lights in every backwoods privy, skies cluttered with helicopters bumping into each other, and cities like the topless towers of Ilium in every township. Everybody will have everything, and it must therefore follow that everyone will be happy.

Progress, in this materialistic sense, is one of the tenets of the American power of this planet, for he is on the way to becoming the ultimate undoing of the entire balance of its economy. When man finally joins the dinosaurs and the sabre-toothed tiger in the fossil beds, he will have left behind changes on the earth's surface which would amaze the engineers who designed the canals of Mars if, indeed, there are canals on that planet.

Some interference with the balance of nature by man is necessary; after all man must live and it is the way of nature that its creatures should provide sustenance for one another. But man does more than his rightful share of preying on nature, and much of it is for the benefit of a civilization, as he prefers to call it, which is inimical to his spiritual essence, however it may promote his material comfort. I will admit, myself, that electric washing machines, refrigerators, and automobiles are fine things to have, and that they have made life more pleasant, but there are too many of us for whom these things have become the end of life itself. Designed to free us from the

progress has been as good for us as the advertising men would have us believe. It would appear that social progress is as much a myth as the story of Cinderella. For example, we have not yet solved the problem of slavery. If anyone believes that the slavery of subordinate employees in industry, business and the laboratory is an improvement over that of the pharaohs, the caesars or the feudal barons, he is harboring a delusion. It differs only in degree from the classic variety and is slightly less reprehensible than that of the modern police state. We must still agree with Thoreau that "the mass of men lead lives of quiet desperation."

Another great flaw in our civilization, which is less apparent in so-called savage cultures, is the disparity between reality and the ideal. As Bergen Evans (*op. cit.*, p. 188) says, "Modern society sometimes looks as if it were deliberately designed by some fiendish experiment in order to drive us insane. We are brought up to expect rewards for certain kinds of behavior and then thrown into a world in which none of the signals works. We are taught as children to be kind, self-sacrificing, and helpful, and never to be greedy or aggressive. Then we must live in a ruthlessly competitive economy. We are taught to be honest, in preparation for a world in which honesty is often penalized and dishonesty, in a thousand forms, is often rewarded."

Such statements as this, which can be verified by any alert observer in any city or community in our land, are hardly the sort of proof necessary for establishing the doctrine of social progress as a natural law. As Bury wrote, we must demonstrate a general increase in human felicity to prove the law of progress. Unfortunately the facts of history are subject to the personal bias of whoever happens to select them in behalf of any particular hypothesis, and men will have to be a lot more rational than they are at present be-

ing aware of the implication of this quotation that doubters of the validity of progress may expect to find themselves summoned before a Congressional committee to investigate the writer nevertheless

history. As Arnold J. Toynbee declares: ". . . it remains true that the facts of the highest order . . . the *comparable units of history*, remain inconveniently few for the application of the scientific technique, the elucidation and formulation of laws." This from a student who has completed six volumes and has three more in preparation on a general law of history! It is natural that such a thorough student of history should be obliged to say something about progress, but that is little indeed: "The illusion of progress as something which proceeds in a straight line is an example of that tendency to oversimplification which the human mind displays in all its activities" (7).

It should be obvious to any one that we are still far from the earthly paradise which appears to be the implicit goal of progress. The greatest barrier to the attainment of such a paradise is the pathological development of our cities. Like great cankers they straddle the land, draining its resources, warping, and stunting the lives of their inhabitants (8). Dreamers of progress in such an abnormal environment are like the tenders of those pathetic window boxes and miniature roof gardens so common in the city, except that instead of tending innocuous geraniums they are cultivating opium poppies. This is a sad distortion of Voltaire's classic advice to cultivate our gardens. As Thoreau once said, reviewing a book by some forgotten Utopian dreamer, "There is a speedier way . . . to fill up marshes, to drown the roar of rivers, to tame hyenas, secure agreeable environs, diversify the land, and refresh it with 'rivalies of sweet water,' and that is by the power of rectitude and true behavior."

A conspicuous thing about the doctrine of social progress is the tendency of its prophets to deny individual liberty and happiness in behalf of the social organism. This is most evident of

remarkable increase in the forebrain was not only one of the causes of malignancy but was to be in the end one great cause of the extinction of man . . . such a result would but class man as one of the many races of animals which perished of special over-growths and a possible lack of fertility" (11).

It is plain that Dr. Julian Huxley is not troubled by such thoughts, for he considers man the product of a progressive force which could have had no other result than the production of man. As if this logic were not had enough, he proceeds to commit the pathetic fallacy (in the actual, rather than the literary sense) of declaring that man, as the product of this progressive force, can now direct this force to alter his own progress: "The future of man, if it is to be progress and not merely a standstill or a degeneration, must be guided by deliberate purpose" (12). This assumption that a mechanistic force can be taken in hand and directed to serve the ends of one of its results is the basic error of most mechanistic philosophers. It is tantamount to saying that we can reverse entropy. Theologians should find this notion particularly reprehensible, since it assumes that man has powers St. Thomas Aquinas denied to the angels. (*Vide Summa Theol. I, Q. 52, Art. 2.*)

If we must choose between varieties of progress, it would be much better to accept the apocalyptic Progress of Rotary and the advertisers than this evolutionary variety. Of course, the Pope would have no traffic with either, denying that he could come to terms with "progress, liberalism, and modern civilization." (*Syllabus of Errors*, 1864.)

The danger of this idea lies in its implicit acceptance of the ant hill as our destiny, for society today is much too loosely organized to enable any government or group of scientists—whether of the American Drosophila sect or the Soviet neo-Lamarckian per-

suation—to take human evolution in hand and direct it on the paths of progress, steering it away from that static or downward trend which is somehow foreseen by Dr. Huxley. A much more authoritarian regime than any now extant is necessary before the future of man can be guided by deliberate purpose.

And if, in the process of trying to steer our evolution, we destroy the essential character of the environment which made us the creatures we found ourselves to be at the start of our experiment, we will have introduced an unknown value into the equation which may change our human nature into something else in spite of our plans. In other words, we may cease to become men and become some other creature: perhaps a pallid, megacephalic, cyclops living in vast, air-conditioned hives. Indeed, some such creature would be more fit for the world we seem to be trying to make of this earth.

If we have any duty to the future, as men of today, it is not to dream of a millennium, cultivating opium poppies in urban hothouses, but to leave the good things of this earth reasonably whole so that, as far as the environment is concerned, our children can still be the same human beings that we are, and find the intangible resources to restore them to the physical and spiritual health we now deny them. But progress, we are told, will bring us all greater leisure, more gadgets, and even improve our essential humanity, and we who protest that the insensate rapes of nature will in the end bring us harm and evil are accused of being reactionary sentimentalists. But the essential character of man, his power to reason, and all that reason means in communication and imagination, places him in closer relation to nature than any other creature, and all our much vaunted progress is a denial of this relationship with nature. We hold, in effect, a lease upon this earth, and the blind pursuit

of material progress is a violation of that lease. We are forgetting to cultivate our gardens. It will be protested by many that all our difficulties will soon be solved by atomic energy. If the spectacle of recent Congressional hearings is an indication of how this problem is to be handled, even the most faithful believer in progress should be profoundly frightened. Even if atomic energy is satisfactorily handled, politically as well as industrially, it is already too late for many of our rivers and much of our forests. Nor will atomic power remove the need for natural resources in an artificial civilization. Indeed, an age of abundant energy, making possible even larger cities and greater populations, would increase the drain upon all other resources. If this is to be the future, it may well be that man's extinction through the misuse of atomic power will best serve the purposes of evolution. Certainly man's lot as a species would be improved by a radical reduction in numbers, and the achievement of that reduction by atomic warfare may, in the long run, be "progressive."

3. Buay, J. B. *The Idea of Progress*. London, Macmillan, 1920.
4. The unimportance of Pilgrim's Progress as a contribution to the history of the idea of progress is plain from Bury's treatise, in which Bury is not even mentioned.
5. Huxley, ALBION. *Science, Liberty and Peace*. New York: Harper, pp. 31-32, 1915.
6. It is not without some sort of significance or other that Henry Ford, who promoted more progress than any other single man in recent history, should have spent so much of the energy and wealth of his declining years preserving village schoolhouses and souvenirs of the last century.
7. Evans, BERGEN. *The Natural History of Nonsense*. New York: Alfred A. Knopf, p. 261, 1946.
- 7a. Tovnse, ARNOLD J. *A Study of History*. Abridgement by D. C. Sonneveld. *Oxford University Press*, pp. 47, 38, 1947.
8. Cities are Abnormal. *University of Oklahoma Press*, 1946.
9. CARPENTER, ENWARD. *Civilization, its Cause and Cure*. London, rev. ed., 1916.
10. SHAFER, ROBERT. *Progress and Science*. *Yale University Press*, p. 10, 1923.
11. HERRICK, C. J. *Malignancy and Evolution*. London: E. Noah & Grayson, Ltd., 1926; quoted from W. M. WITFILER's essay, *Emergent Evolution*, contained in "Essays in Philosophical Biology," *Harvard University Press*, p. 163, 1939.
12. HUXLEY, JULIAN. *Evolution, the Modern Synthesis*. New York: Harper, p. 577, 1943; see also my paper in *Bios*, *The Philosophic Jellyfish*, March, 1947, pp. 43-48.

REFERENCES

1. PHILIPS, H. B. On the nature of progress. *Amer. Sci.* 33 (4): 253-259.
2. AYRES, C. E. The Theory of Ecological Progress. *Chapel Hill*, p. 244, 1944.

The Geological Society of America
Memoir 67

TREATISE ON
MARINE ECOLOGY AND PALEOECOLOGY

Volume 1

ECOLOGY

Joel W. Hedgpeth, *Editor*

University of California, Scripps Institution of Oceanography
La Jolla, Calif.

Prepared under the direction of a Committee of the Division of Earth Sciences
National Research Council, National Academy of Sciences
Washington, D. C.



December 30, 1957

Foreword

The late Dr. T. Wayland Vaughan, who had long been interested in marine ecology and paleoecology, in 1940 planned and organized a Subcommittee on the Ecology of Marine Organisms as a part of the Committee on Geologic Research (Norman L. Bowen, Chairman) in the Division of Geology and Geography of the National Research Council of the National Academy of Sciences. The members of this Subcommittee were: C. H. Edmondson, Remington Kellogg, Harry S. Ladd (Chairman), Kenneth E. Lohman, Roger Revelle, F. W. Rolshausen, H. C. Stetson, T. Wayland Vaughan. The first annual report, which attempted to summarize current activities in marine ecology and paleoecology, was issued in 1941. In this report the possibility of preparing an ecological treatise was mentioned. In 1942 the Subcommittee was made a full Committee and its title was changed to Committee on Marine Ecology As Related to Paleontology to emphasize the paleontological nature of its interests. With the encouragement and assistance of Walter H. Bucher, Chairman of the Division of Geology and Geography, the Committee in its second report, issued at the close of 1942, briefly listed its aims. There were six of these, the last of which read: "Possibly, at a later date, to prepare a special treatise on ecology that would stress geological interpretation." World War II greatly curtailed most activities in marine ecology and also curtailed the activities of the Committee. Serious consideration was given to the possibility of recessing the work, but the members felt that it might be difficult to revive the program if work was stopped. Interest in the *Treatise* continued at a low level until the war was over, but in 1946 in its sixth annual report the Committee published a tentative outline for the *Treatise* and invited criticism. In this same year Kenneth E. Lohman was made Vice-Chairman of the Committee.

During the first 5 years of its existence the group that formed the original Subcommittee continued to serve. Gordon Gunter was added as a member in 1942 and Earl H. Myers in 1944. In 1946, the sixth year, H. C. Stetson resigned because of the pressure of other duties, and three new members were added: K. O. Emery, of California, A. W. B. Powell, of New Zealand, and H. G. Schenck, then stationed in Japan. In 1947 four more members were added: R. H. Fleming, Julia Gardner, J. B. Reeside, Jr., and Waldo L. Schmitt. At a two-day meeting held in March 1947, Gordon Gunter was named Vice-Chairman for Biology, Kenneth E. Lohman Vice-Chairman for Geology, and Roger Revelle Vice-Chairman for Oceanography; and concrete plans for the completion of the *Treatise* were formulated. In 1948 Frank C. Whitmore was made a member, and in the following year Roland W. Brown and Joel W. Hedgpeth were added and assumed editorial duties. These additions brought the total membership of the Committee to 19. In 1951 Doctor Vaughan asked that his name be dropped from the Committee because of his failing eyesight. The Committee accepted his resignation reluctantly, and John W. Wells was appointed to fill the vacancy.

possible the aid of nearly 100 specialists was enlisted, each of whom prepared one or more units in his particular field. To this large group the Committee extends its deepest thanks. Formal titles of the contributors are not given but the field of interest of each is indicated, together with his address at the time of going to press.

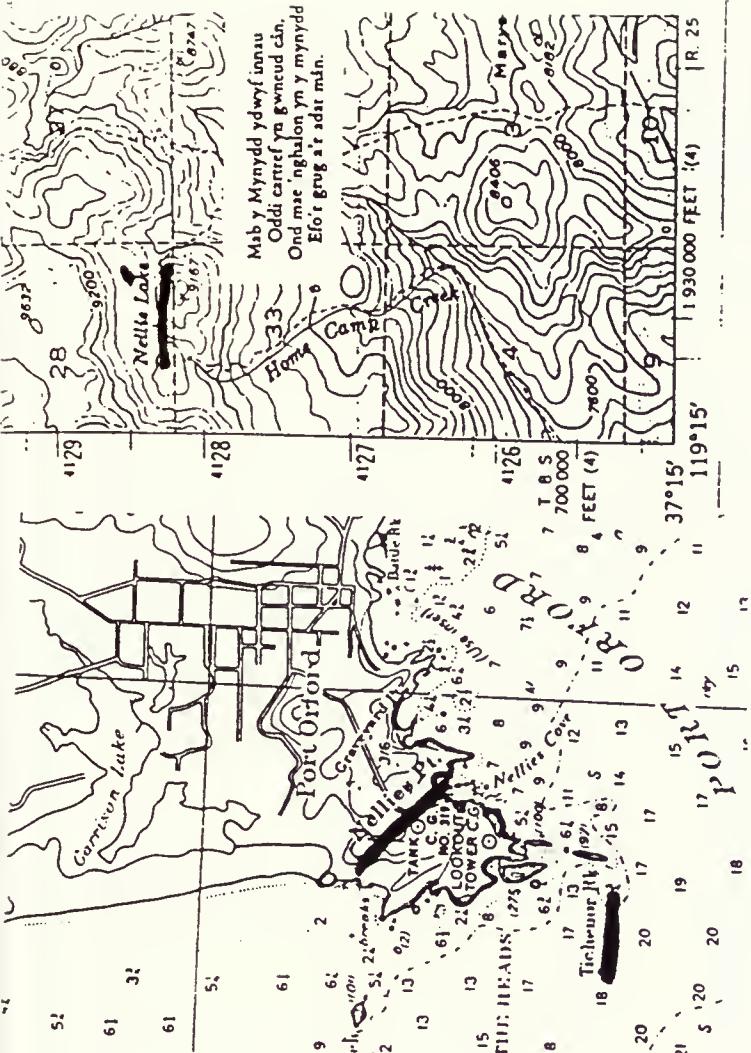
The Committee wishes to express its thanks to the Office of Naval Research, whose support made it possible for Vice-Chairman Gunter to make an extended stay at the University of California, Scripps Institution of Oceanography and a short visit to the Woods Hole Oceanographic Institution in 1948-1949. Later, through a similar co-operative arrangement between the Scripps Institution of Oceanography and the Office of Naval Research, Joel W. Hedgpeth was able to spend several years at Scripps assembling and organizing the materials for volume I and writing certain of the units. During the summer of 1953, again with the support of the Scripps Institution and the Office of Naval Research, he was able to travel in Europe and consult with many of the contributors to the *Treatise*. The Committee also desires to express its appreciation to the United States Geological Survey for encouragement and support; six members of the Committee and many of the other contributors to the *Treatise* are on the staff of the Geological Survey. Many members of the staff of the Geological Survey, the Scripps Institution, the National Museum and of other organizations have assisted the Committee in the critical review of manuscripts; this help is gratefully acknowledged. We also wish to thank Karl P. Schmidt for translating Chapter 25, which was submitted in German.

Messrs. Walter H. Bucher, W. W. Rubey, Arthur Bevan, Ernst Cloos, and Francis Birch, who have successively served as Chairman of the Division of Geology and Geography—now known as the Division of Earth Sciences—since the formation of the Committee have encouraged and supported the work in every way possible. The Committee desires to express its special thanks to Miss Margaret L. Johnson, Secretary to the Division, for great assistance particularly in assembling and duplicating of the Annual Reports, and to Mr. G. D. Meid, Business Manager of the National Academy of Sciences, National Research Council, for aid in making publication arrangements for the *Treatise*.

From the start the *Treatise* has been planned as an appraisal of accomplishments in the fields of marine ecology and paleoecology, particularly those ecological investigations related directly or indirectly to paleontology. In attempting to obtain broad coverage the Committee and its collaborators discovered several blank areas in the paleoecological field and thus initiated several investigations that otherwise might not have been started until some time later. These developments were gratifying and have served to bridge the gap between past and present work in the field. Paleoecology, though it deals with the past, is a comparatively youthful but active branch of paleontology.

With these thoughts in mind it was decided to supplement the appraisals of past work with some sort of prophetic look into the future. In what direction is paleoecology going, how far may it hope to go, and what sorts of tools may be used in the future? Some of the new techniques developed in borderline fields

Chapter 1. Introduction. By Joel W. Hedgpeth	1
Chapter 2. Classification of Marine Environments. By Joel W. Hedgpeth	17
Chapter 3. Concepts of Marine Ecology. By Joel W. Hedgpeth	29
Chapter 4. Obtaining Ecological Data in the Sea. By Joel W. Hedgpeth	54
Chapter 5. General Features of the Oceans. By Richard H. Fleming	87
Chapter 6. Solar Radiation, Submarine Daylight, and Photosynthesis. By Robert W. Holmes	100
Chapter 7. Salinity. By A. S. Pearce and Gordon Gunter	120
Chapter 8. Temperature. By Gordon Gunter	139
Chapter 9. Oxygen in the Ocean. By Francis A. Richards	185
Chapter 10. Carbonates and Carbon Dioxide. By Roger Revelle and Rhodes Fairbridge	239
Chapter 11. Nutrient Elements. By H. Barnes	267
Chapter 12. Biogeochemistry of Trace Metals. By Edward D. Goldberg	315
Chapter 13. Marine Biogeography. By Joel W. Hedgpeth	330
Chapter 14. Particulate Organic Detritus. By Denis L. Fox	332
Chapter 15. Interrelations of Organisms	332
A. Commensalism. By R. Phillips Dales	301
B. Parasitism. By Sewell H. Hopkins	413
C. Symbiosis. By C. M. Yonge	429
Chapter 16. Plankton. By Martin W. Johnson	443
Chapter 17. Bottom Communities. By Gunnar Thorson	461
Chapter 18. Rocky Intertidal Surfaces. By Maxwell S. Doty	535
Chapter 19. Sandy Beaches. By Joel W. Hedgpeth	587
Chapter 20. Coral Reefs. By John W. Wells	609
Chapter 21. Submarine Canyons. By Conrad Limbaugh and Francis P. Shepard	633
Chapter 22. Deep Sea and Abyssal Depths. By A. F. Bruun	641
Chapter 23. Estuaries and Lagoons. By K. O. Emery, R. E. Stevenson, and Joel W. Hedgpeth	673
Chapter 24. Baltic Sea. By S. G. Segerstråle	751
Chapter 25. Black Sea and the Sea of Azov. By Hubert Caspers	803
Chapter 26. Caspian and Aral Seas. By L. A. Zenkevich	891
Chapter 27. Lunar Periodicity. By P. Koringa	917
Chapter 28. Fluctuations in Littoral Populations. By Wesley R. Coe	935
Chapter 29. Mass Mortality in the Sea. By Margaretha Brongersma-Sanders	941
ANNOTATED BIBLIOGRAPHIES	
General Introduction. By Joel W. Hedgpeth	1011
Marine Bacteria. By Robert J. Menzies	1029
Marine Bacteria. By Claude E. ZoBell	1035
Marine Algae. By Maxwell S. Doty	1041
Nonalgal Marine Plants. By Edwin T. Moul and Roland W. Brown	1051
Marine Diatoms. By Kenneth E. Lohman	1059
Protozoa	1069
Radiolaria. By William R. Riedel and Esther Aberdeen Holm	1069
Silicoflagellata. By G. Dallas Hanna	1073
Foraminifera. By Earl H. Myers and W. Storrs Cole	1075
Marine Sponges. By M. W. de Laubenfels	1083
Corals. By John W. Wells	1087
Recent Octocorals. By Frederick M. Bayer	1105
Recent Bryozoa. By Raymond C. Osborn	1109
Brachiopods. By G. A. Cooper	1113
Marine Worms. By Olga Hartman	1117
Oysters. By S. H. Hopkins	1129



At Port Orford, Oregon,

Tichenor Rock is named (appropriately) for my greatgrandfather William Tichenor, and Nellie's Cove for his daughter, who collected agates there (she, Sarah Ellen Tichenor, was my grandmother).

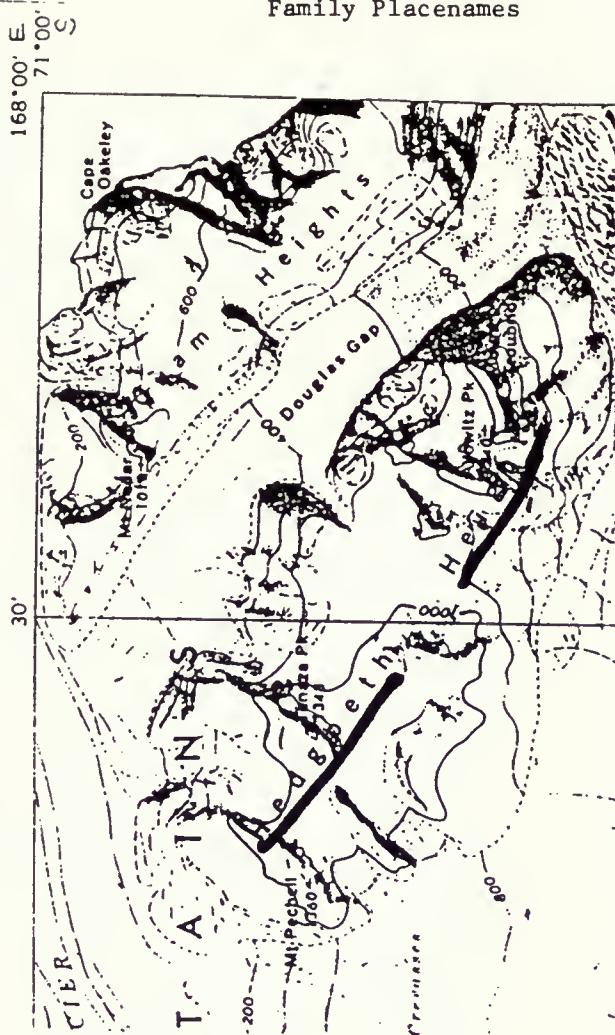
Nellie Lake, in the Sierra north of

Huntington Lake, is for my mother who as a teaching missionary, roamed the mountains around North Fork on

horseback. Hedgpeth Heights in the

Antarctic was named for me for having survived the USARP bureaucracy.

It will not be available for subdividing for some time.



**Summary of Statement to the Natural Resources Subcommittee
of the Committee on Government Operations,
Congress of the United States, House of Representatives,
on the San Francisco Bay-Delta Estuary —
an Ecological System, San Francisco, California,
August 21, 1969.**

by

Joel W. Hedgpeth

Much has been said about obtaining the maximum benefits from a natural system, as if a body of water could be partitioned to serve all the possible purposes that man could think of. The multiple purpose concept is not as simple as it sounds when applied to a dynamic environment. Because of our scale of values and the different timing of our demands, our purposes may not coincide with the operations of the natural system. In other words, man's talk of "purpose" means the purposes to which he would put nature, not nature's use of itself. So far, all the plans for water diversion, wastewater disposal and modification of the natural system of rivers, bays and nearshore ocean in central California have been an attack on nature, not a design to live with nature, and we have lost sight of the purpose or purposes that man should gain from this system.

If we view the system from the historical perspective it is obvious that the first purpose of San Francisco Bay (in its broadest sense) was to provide food. This is amply attested to by the more than 400 shell middens left by the Indians on the shores of the Bay. In Indian time as now the San Francisco Bay area was one of the most populous regions in California, but the base for this population was the ecologically natural base of abundant food supply. Perhaps only a few thousand Indians were maintained in this natural system under a sustained yield basis, but it appears to have been a stable culture that endured for more than 3,000 years. This culture came to an end, at least symbolically, with the establishment of San Francisco in 1776, five days before the Declaration of Independence. Now, only seven years before the second century of occupation of the Bay area by the destructive, anti-ecological culture of allegedly civilized man, there is serious concern by many that we may not last the next hundred years. Probably we will out live the gloomier prophets of doom, but it is inconceivable that we can endure in this locality for 3,000 years at the present rate of violent

environmental exploitation.

In any event, man's first purpose for nature, as a resource for food, was served in San Francisco Bay to significant degree after displacement of the original culture for at least a hundred years, until 1876 or perhaps until 1900. However, even by 1876 there were indications that pollution from sewers was locally offensive, and the reliance on the resources of the bay proper declined, although such resources as fish whose well being depended on the estuarine and delta reaches of the bay continued to be important, and still are.

The second purpose that man found for San Francisco Bay was to serve his commerce. The Indians paddled across the narrower parts of the Bay on rafts of tules, but the use of the bay for commerce was negligible until mid 19th Century. Although the shell mound cultures may have exported as much as a third of their harvest to the interior, it was probably carried overland. In terms of human history the sequence has probably been the same everywhere — man first settled on the shore for food, then he ventured upon the waters, first for fishing, then for exchange of goods with other cultures.

In San Francisco Bay fishing came after commerce, and oyster culture, developed last of all, had the shortest run. In the older, more established cultures, cultivation of the spacious tidal flats of the bay would have been one of the first purposes developed.

The third purpose to which we have put San Francisco Bay has been the most short sighted and destructive one of disposal of mining wastes and later of sewage. At first little notice was taken of the use of San Francisco Bay as a cesspool but the steady shoaling of the bay from hydraulic mining debris did receive notice. However, the prime reason for stopping this rapid shoaling was not that it was filling the bay but that it was destroying prime agricultural land. There is too much talk of "response" of waters to introduced materials, the capacity of the bay to "accept" waste

materials and dilute them to concentrations that are inoffensive to man or not overtly deleterious to aquatic life. This purpose, which is considered a "benefit" in the lexicon of the sanitary engineer, is an anti-ecological approach to the environment. It says essentially that man's purpose is to abuse nature. In a multiple-use scheme for exploitation of the environment it is the anti-ecological purpose that may have the most effect on the environments, bring into action a sort of Gresham's Law for ecology — that bad environments will drive out good environments. Filling the bay would of course destroy the bay entirely, and can hardly be considered a legitimate purpose in terms of the natural environment.

This brings us to a purpose that was not realized or understood until fairly recently, that is, the bay serves as a moderator of our climate because of its surface area. It seems tautological to say that the Bay area without the bay would not be the Bay Area, but such proposals as the Reber Plan to dam it off completely and fill most of the shallow areas were certainly made in ignorance of the importance of the surface area of the present bay, whose characteristics as an ameliorating influence on local climate depend directly on its circumstances as a body of water subject to tidal fluctuation.

Even the Kaiser engineers, in their elaborate reports on the *cloaca maxima* the Bay area, concede that San Francisco Bay is a "unique natural resource," yet their proposals are made either without reference to the effect of other engineering designs for the total system, or on the assumption that they will inevitably be constructed. The reassurances that as many purposes as possible will be served by the proposed alterations in the natural environment may sound like good engineering, but such a plumber's apocalypse is

bad ecology. The problem overlooked here is that reduction of environment to the lowest common denominator of multiple engineering purposes (and protection of fish and agricultural lands appear to be after thoughts in the plans) may have a synergistic effect — all of these modifications may act together to produce an effect greater than the sum of the separate parts, and the Gresham's Law of ecological environments could operate to produce the most unfavorable environment for every purpose of both man and nature.

We would better serve our future if we reversed our priorities for the San Francisco Bay and delta area, if we dedicated our engineering skill to achieving first the maximum production of fisheries resources, maintenance and improvement of established agricultural lands and amelioration of the climate, and secondly to diverting water to other areas already out of ecological balance with their environment, and lastly to developing lands of dubious productivity. Perhaps we do not know all we need to know to achieve these ends, but our present pell-mell collision course with the environment will not be solved by more knowledge unless we also change our course. There may simply not be enough water to serve our highest needs and purposes and to serve those of another drainage basin as well. If so, we should not seek means to act upon the decision we will have to make eventually, namely that uncontrolled growth of cities is not in itself a good to be encouraged and fostered, but that it must be controlled and where necessary limited. Certainly we cannot treat the Bay area as an afterthought and expect it to survive as a uniquely different region, or to maintain its natural resources in a system of engineering works designed for another purpose.

The Edward W. Browning Achievement Awards are made annually for distinguished international achievement in five major areas:

- Conserving the Environment
- Prevention of Disease
- Alleviation of Addiction
- Spreading of the Christian Gospel
- Improvement of Food Sources

The late Edward W. Browning conceived of the awards many years ago when he was at the height of his career as a colorful and successful real estate entrepreneur. He had a profound interest in the "well being and happiness" of mankind and hoped that these awards would stimulate public concern in "religious, moral, social, economic, and intellectual" endeavors.

THE EDWARD W. BROWNING
ACHIEVEMENT AWARDS

1976



After Mr. Browning's death in 1934, a life interest in his estate benefited his adopted daughter. When she died, the New York Community Trust received the judicial appointment to administer the Browning awards. The first awards were made in 1971.

The awards are formally announced each year on October 16th, the founder's birthday. Each consists of a tax-exempt honorarium of \$5,000 and a medal, bearing the likeness of Mr. Browning, designed by portrait sculptress Eleanor Platt. Nominations are made to the Distribution Committee of The New York Community Trust by distinguished learned groups in each of the five award areas.

CONSERVING THE ENVIRONMENT

For the person who has made an outstanding contribution in enhancing the quality of our physical environment.

Nominees are proposed by the Smithsonian Institution, Washington, D.C., which sponsors research in a wide variety of learned subjects. The Institution has long been concerned with objective research in the environment and in ecology.

1976 AWARD

Dr. Joel W. Hedgpeth

*Emeritus Professor, Oregon State University
Newport, Oregon*

Scholar, scientist, lecturer, editor, Joel W. Hedgpeth is perhaps most importantly, a friend to planet Earth. Far ahead of his time in recognizing that man-made "progress" can be a serious threat to the environment, Dr. Hedgpeth has long been teaching, writing and demonstrating through research that the natural systems of the earth and the seas are exceedingly complex, exceedingly fragile and exceedingly important. His work has led to the passage of significant environmental legislation, the addition of marine programs to school curricula, and the continued growth of what he calls "scientific beachcombing."

The San Francisco Bay and Delta, the rocky and sandy shores of California and Oregon, Tomales Bay, the coast and bays of Texas, Northern California's coastal ranges, Surprise Valley in California, the Antarctic shores and the Galapagos Islands all have been the subject of



1976 *Dr. Joel W. Hedgpeth*

PREVIOUS AWARD WINNERS

1975 *Dr. Archie F. Carr, Jr.*

1974 *Dr. Raymond F. Dasmann*

1973 *Sir Frank Fraser Darling*

1972 *Dr. Paul Bigelow Sears*

1971 *Dr. George Evelyn Hutchinson*

Dr. Hedgpeth's scientific scrutiny, and recently he has added the South Pole and Australia to his agenda.

A colleague, Ritchie R. Ward, writing in the book *Into the Ocean World* says: "It is quite impossible for me to think about inspired teaching without thinking of my friend Joel W. Hedgpeth. He has made teaching his life work, and he points to his students as the proudest product of his efforts. Of course, teaching is done in many ways. It can be done through the writing of books, through classroom instruction, through demonstrations in the field, and, perhaps most important, by example. Joel Hedgpeth has done all of these."

Born in Oakland, California, Joel Hedgpeth received his Ph.D. from the University of California. He joined the staff of Scripps Institution of Oceanography, where one of his chief responsibilities was the compilation and editing of the now classic *Treatise on Marine Ecology and Paleoecology*, which was published by the Geological Society of America in 1957. Volume I, on marine ecology, is 1,296 pages long and is authored by experts all over the world, many of whom Hedgpeth, with characteristic diligence, visited personally. Hedgpeth also wrote the introduction, which has been called "an invaluable survey of the scope and history of marine ecology."

After the Treatise was published, Dr. Hedgpeth accepted an appointment as professor of zoology and director of the Pacific Marine Station of the University of the Pacific at Dillon Beach. Here he taught students about the environmental problems of the Bay, and drew inspiration for what is perhaps the most widely used of his books—a little paperback called *Seashore Life of the San Francisco Bay Region and the Coast of Northern California*. It was first published in 1962 and went into its fourth printing in 1970. Ward writes that "it can be found in any library and for sale at any seaside settlement along the central California coast. How many tide-pool novices

and veterans alike have carried it with them to the shore would be impossible to guess."

In 1965, Dr. Hedgpeth accepted the position of Professor of Oceanography and Director of Oregon State University Marine Science Center at Newport. From Newport, he roams the world teaching, lecturing and serving as scientific consultant.

The Oregon Academy of Science, citing Dr. Hedgpeth for outstanding achievement, says "Because of his knowledge and communication skills, he is often asked by legislative bodies, planning commissions and citizens' groups to assist in solving marine and estuarine environmental problems. His influence in these matters is recognized nationally and internationally."

Author of hundreds of books, book reviews and commentaries, Dr. Hedgpeth's writing style is as attractive as it is accurate. "There is," says Ward, "an infectious enthusiasm about Hedgpeth's writing that makes it irresistible." He laces his scientific abstracts with literary references—Thoreau, Robert Burns—suggesting his wide-ranging interest and talents. And he is, indeed, also a poet and Irish harpist. A dramatic lecturer, he is said, for example, to have spent an afternoon prowling antique shops in search of an antique saber to wave at a lecture to illustrate a point.

Dr. Hedgpeth has received the highest scientific honors, both in America and abroad. Yet he says, "The motivation for studying the seashore is not to produce scintillating ideas that win prizes or gain admission to academies, but to gain fresh understanding, further insight into the orderly jumble of processes and interactions on the world's most significant interface, the edge of the largest of living spaces on our globe. And so we hope that the seashore will still be worth visiting when all the lands are filled with people and machines."

OREGON ACADEMY OF SCIENCE, CITATION FOR OUTSTANDING ACHIEVEMENT

AWARDED FEBRUARY 23, 1974 to JOEL W. HEDGPETH

Joel W. Hedgpeth, Professor of Biological Oceanography, Oregon State University, has been a recognized leader in the development of marine biology on the Pacific Coast for 25 years. As a research scholar, he has contributed significantly to the literature of Pycnogonids, Crustacea, Mollusks and marine ecology. He has written extensively in the fields of marine and estuarine ecosystems and is the reviser of the standard intertidal biology book for our coast, Between Pacific Tides.

He completed his degrees at the University of California, Berkeley campus. He held positions with the U. S. Engineer Department, U. S. Bureau of Reclamation, Texas Game Fish and Oyster Commission, University of Texas, Scripps Institution of Oceanography, and was Director of the Pacific Marine Station of the University of the Pacific before joining the School of Oceanography staff of Oregon State University in 1965.

Because of his knowledge and communication skills, he is often asked by legislative bodies, planning commissions and citizens' groups to assist in solving marine and estuarine environmental problems. His influence in these matters is recognized nationally and internationally. The Oregon State University Press will soon publish a compilation of his entire environmental writings.

His book reviews and commentaries are highly valued by other authors, publishers and colleagues alike. In addition to his professional scientific contributions to our society, he also is widely known as writer, poet and Irish harpist. Inspiration and enjoyment is provided to many through his contributions in the literary and musical arts.

He is a Fellow of the California Academy of Sciences, and a past-president of both the Western Society of Naturalists and western section of the American Society of Limnology and Oceanography.

Through his energetic and stimulating leadership, marine programs in schools have become important curriculum additions. The groundwork he had laid with teachers has provided a solid foundation for the education of a citizenry aware and appreciative of the significance of the marine environment. His impact by activities continues to spread from Oregon and California throughout the land.

Joel W. Hedgpeth is a dedicated scholar, scientist, lecturer, editor, poet, educator, mentor and perhaps most importantly, a friend to all who are concerned with man's relationship with the planet Earth.

Vita or Curriculum Vitae
of
Joel W. Hedgpeth

(as of December 31, 1972)

Marine biologist, systematic zoologist (Pycnogonida), environmentalist (since 1921), lecturer and writer.

Born: September 29, 1911 at 4 in the morning at his grandfather's house, 929 Chestnut Street, Oakland, California.

Father: Joel Hedgpeth, 1875-1956, born on Little Dry Creek near Academy, Fresno County, California. (a blacksmith).

Mother: Nellie Tichenor McGraw, 1874-1956, born at 1126 - 21st Street, San Francisco. (a Presbyterian missionary, teaching California Indians).

Wife: Florence Warrens, born October 2, 1911, north of Cedarville, Modoc Co., California

Children: Sarah Ellen, born 1950 at Berkeley, Calif.; Warren Joel, born 1952 at San Diego, Calif. during campaign parade for Eisenhower.

Education:

Pre-school. My grandfather's library and the family attic (including accumulated back magazines to 1889).

Grade 1, Lincoln School, Stockton, Calif. 1918; Grade 2, Haight School, Alameda, Calif., 1919; Cole School, Oakland, promoted to L3 Jan. 1920; Grades 3-4, Lincoln School, Berkeley, Calif., 1920-21; Grades 4-5, Palo Alto Military Academy, 1922-23; Grades 6 through 8, Washington School, San Leandro, Calif., 1924-25; Grade 9, Lockwood Jr. High, Oakland, Calif., 1925-26; Grades 10-12, Fremont High School, Oakland, Calif., 1926-29; San Mateo Jr. College, 1929-31; University of California, Berkeley, 1931-33; 1933-34; 1938-39, M.A. in Zoology awarded 1940, Thesis, "Factors limiting the distribution of Diaptomid Copepods," Committee in Charge: S. F. Light, H. J. Kirby and W. B. Herms; University of Texas, 1948-49, not advanced to candidacy because of internecine dispute, returned to University of California, Berkeley, 1949-51, Ph.D. formally awarded in 1952, Thesis, "Ecological and distributional relationships of marine and brackish water invertebrates of the coasts of Texas and Louisiana," Committee in Charge: Ralph I. Smith, J. Wyatt Durham and Willard D. Hartman.

Languages: English, written and spoken. Reading knowledge of German and French. Can decipher, with codebooks, Russian and Welsh..

Places lived in for at least six months:

Oakland, Calif. (929 Chestnut St., 1911-12; 1919-20; 1015 Hollywood Ave., 1934-35); Clippergap (near Auburn, Calif.) 1914-16; Stockton, Calif. 1917-18; Alameda, 1919; Berkeley (1919 - 1/2 Fairview St.) 1920-21; Mather, Yosemite National Park, 1921-22; Palo Alto, Calif. (at Palo Alto Military Academy) 1922-23; San Leandro, Calif. 1923-29; San Mateo, Calif., 1929-31; Berkeley, Calif. 1931-33; Ridge (near Willits) summers 1933, 1934; Washington, D. C. 1935-36; Walnut Creek, Calif. 1936-39; in field, Sierra foothills, 1939; Baird (near Redding) 1939-40; Sacramento, Calif. 1941; Walnut Creek, Calif. 1942-45; Rockport, Texas 1945-47; Port Aransas, Texas, 1947-50; Berkeley, Calif. 1950-51; La Jolla, Calif. 1951-57 (with summers at Dillon Beach, Calif.); Dillon Beach, Calif. 1957; Sebastopol, Calif. 1957-65; Newport, Oregon 1965- .

Countries and places visited:

England, France, Germany, Denmark, Italy, New Zealand, McMurdo Sound, Palmer Peninsula, Chile, Japan, British Columbia, Baja California and Sonora, Devon, Cornwall, Cardigans, Merioneth, Northumberland, Argyll, Helgoland, Hesse, Provence (La Camargue), La Paz and Guaymas, Vancouver and Queen Charlotte Ids., Hawaii (Oahu), Canal Zone, Ecuador, Galapagos, Alaska (Pt. Barrow).

Environments:

San Francisco Bay and delta; rocky and sandy shores of California and Oregon; Tomales Bay; coast and bays of Texas; coastal ranges of northern California; Surprise Valley, Calif.; Antarctic and Galapagos shores.

Employment:

Current position: Professor of Biological Oceanography, Oregon State University. Since 1965.

Previous employment: Lab. Asst. (part time, student), San Mateo Jr. College, Aug. 1930-June, 1931; Odd jobs and student during depression years, including scientific artist for S. F. Light, etc., 1934-36; Printer and proofreader, Piedmont Press, Oakland, Calif., 1936; CAF-2, Div. Loans & Currency, Treasury, Washington, D.C., May 1936-April 1937; Clerk, Calif. State Compensation Insurance Fund, San Francisco, Sept. 1937-June 1938; Jr. Aquatic Biologist, U.S. Corps of Engineers, Sacramento, Calif., June 1938-Nov. 1938; Jr. Aquatic Biologist, U.S. Bur. Reclamation, Redding, Calif., Sept. 1939-Dec. 1940; Lab. Asst., Div. Animal Industry, Sacramento, Calif., April 1941-Dec. 1941; Freelance writing and independent self-supported research culminating in major systematic monograph on Pycnogonida, at Walnut Creek, Calif., 1941-45; Marine biologist, Texas Game Fish & Oyster Comm., Rockport, Texas, Feb. 1945-June 1947; Asst. Res. Scientist, University of Texas, Marine Science Center, Port Aransas, Texas, June 1947-June 1949; Visiting instructor and professor, Pacific Marine Station, University of the Pacific, summers 1948, 1949, 1950,

1951, 1955, 1956; Teaching Assistant in Zoology, University of California, Berkeley, 1949-50; Assistant Research Biologist, Scripps Institution of Oceanography, 1951-57; Professor of Zoology and Director, Pacific Marine Station, University of the Pacific, Dillon Beach, 1957-65; Professor of Biological Oceanography and Resident Director then Head Yaquina Biological Laboratory of Marine Science Center, Oregon State University, Newport, Ore., 1965- ; Visiting Professor, Stanford University (TE VEGA Cruise 17), Spring 1968; Visiting Professor, University of Arizona at Puerto Penasco, Sonora, June-July 1972.

Consulting experience:

Editorial consultant for various publishers at college textbook level and editorial advisor for school science series; various advisory panels for the National Science Foundation and Office of Naval Research on systematic biology, oceanographic facilities and marine biology; expert witness in defense of environment on San Francisco Bay delta system, consultant on environmental impact analysis for nuclear power plants; analysis of master plan for Tomales Bay. Committee to analyze oceanographic manpower for National Science Foundation; Board of Visitors, Invertebrate Zoology, U. S. National Museum; Marine Biology, Woods Hole Oceanographic Institution.

Grants and contracts (all now expired):

For systematic zoology (Pycnogonida), National Science Foundation; long term studies of the near shore environment, Office of Naval Research; Research Participation for High School and Jr. College Teachers, National Science Foundation; Antarctic biology, National Science Foundation.

Courses taught:

General Ecology; Marine Biology; Invertebrate Zoology; Introductory Entomology; Marine Zoogeography; History of Marine Biology and development of ideas therein; The Death of Progress (an environmental colloquim).

Lecture subjects:

The Pycnogonida; Historical Aspects of Marine Biology; Radioactivity in the Sea; The California Water Plan; Life of Intertidal Zones; Philosophy on Cannery Row (Ed Ricketts & John Steinbeck); The Recycling of Excalibur -- Environmentalist as a Celtic Revival; Poetry of the Sea; The Estuarine System; My life as an environmentalist, etc.

Editorial experience:

Treatise on Marine Ecology for Geological Society of America; member of various editorial boards, including Pacific Discovery, Ecology,

Limnology and Oceanography, and editorial referee for Science, Marine Biology, etc. Currently member editorial board of The Veliger, Quarterly Review of Biology, and Oceans magazine; advisor on Invertebrate and Marine Biology, McGraw-Hill Co.

Professional society memberships:

Founder, Society for the Prevention of Progress, 1944; Sigma Xi; Fellow, California Academy of Sciences; Charter Member, Society of Systematic Zoology and American Society of Limnology and Oceanography; member, Ecologica, Society of America, AAAS, Marine Biological Association of the United Kingdom, Western Society of Naturalists. Offices: President, Western Section of ASLO, 1966; Western Society of Naturalists, 1970.

Professional recognition:

Delegate for U. S. Geological Survey, Colloquim on Nomenclature, International Congress of Zoology, Copenhagen 1953; Member International Colloquium on Classification of brackish and estuarine waters, Venice 1957; Convener, First International Congress of Oceanography, U. N., New York 1959; Fellow, California Academy of Sciences, 1960; Faculty Research Lecturer, University of the Pacific 1961; California Conservation Award 1961; Member, organization committee for Association of Tropical Biology, Barro Colorado Canal Zone 1963; Invited speaker and summarizer, Colloquium on Estuaries, Jekyll Island, Georgia 1964; Surtsey Research Conference, Iceland 1965; Convener, Symposium on Estuaries, AAAS meetings, Berkeley 1965; Life Fellow, International Oceanographic Foundation, 1967; Visiting faculty, Stanford University TE VEGA cruise 17 to the Galapagos 1968; Contributor, National Symposium on Thermal Pollution, Portland 1968; Member, SCAR Symposium on Antarctic Biology, Cambridge, England 1968; Participant, Conference on Ecological Aspects of International Development at Airlie House, Va. 1968; Visiting lecturer, University of Wyoming 1969; Participant, Conference on Environment "No Deposit-No Return" of U. S. National Commission for UNESCO, San Francisco 1969; Invited speaker, California-Nevada Wildlife Conference, Fresno 1970; Participant, Conference on John Steinbeck, Corvallis 1970; Commencement speaker, Fresno State College, 1970; Member, Congress on Population and Environment, Chicago 1970; Invited speaker, Air & Water Pollution Workshop, Boulder, Colo. 1970; Convener, Ocean World Conference, Tokyo 1970, Summarizer, Northwest Estuarine and Coastal Zone Symposium, Portland 1970; Visiting lecturer, Brigham Young University 1971; Conference on Conservation Problems in Antarctica, Blacksburg, Va. 1971; Second Coastal and Shallow Water Research Conference, Los Angeles 1971; Antarctic Medal 1971; Summarizer, Symposium: The Fate of the Chesapeake Bay, College Park, Md. 1972; Visiting scholar, Virginia Polytechnic Institute 1972; Coastal Zone Workshop, Woods Hole, Mass.: 2nd Congress of History of Oceanography and CHALLENGER Centennial, Edinburgh 1972; Helgoland Symposium: Man in the

Sea, 1972; Law of the Sea Conference, Seattle 1972.

Publications:

Over 100 titles, exclusive of book reviews, short commentaries, abstracts, verse, etc.

Books:

Treatise on Marine Ecology and Paleoecology, Vol. 1, Ecology. Geol. Soc. America 1957 (editor).

Between Pacific Tides by Edward F. Ricketts and Jack Calvin, Stanford University Press. Latest edition, 1968 (reviser and contributing author).

Introduction to Seashore Life of the San Francisco Bay Region, University of California Press, 1962.

Other: (selection of typical titles):

Livingston Stone and Fish Culture In California, Calif. Fish & Game 27(3), 1941; Reexamination of the Adventure of the Lion's Mane, Sci. Monthly, 60, 1945; On the Evolutionary Significance of the Pycnogonida, Smiths. Misc. Colls., 106(18), 1947; The Pycnogonida of the Western North Atlantic and the Caribbean, Proc. U. S. Nat. Mus., 97, 1948; An introduction to the Zoogeography of the Northwestern Gulf of Mexico with Reference to the Invertebrate Fauna, Publ. Inst. Mar. Sci. Texas, 3(1), 1953; Some preliminary consideration of the Biology of inland mineral waters, Arch. Oceanol. Limn. Venezia 11, Suppl., 1959; Pycnogonida of the North American Arctic, J. Fish. Res. Bd. Canada, 20(5), 1963; Bodega Head - a partisan view, Bull. Atomic Scientists, March, 1965; Ecological Aspects of the Laguna Madre, a hypersaline estuary, AAAS Symposium, Estuaries, 1967, The Atyid shrimp of the genus Syncaris in California, Int. rev. ges. Hydrobiol., 53(4), 1968; An intertidal reconnaissance of rocky shores of the Galapagos, Wasmann J. Biol., 27(1), 1969; Philosophy on Cannery Row in Steinbeck, the Man and His Work, Ore. State Univ. Press, 1971; Perspectives of benthic ecology in Antarctica in Research in the Antarctic, AAAS, 1971.

By Jerome Tichenor: Poems in Contempt of Progress, The Clandestine Press, 1965.

J W Hedgpeth --6

Addendum, Vita, 1973-74. (as of March 17, 1977)

Departed from Oregon State University, Sept. 30 1973; currently emeritus professor.

Adjunct Professor, Pacific Marine Station of the University of the Pacific, 1974 --

Visiting professor, Scripps Institution of Oceanography, Spring Quarter, 1976 (Lectures on the history of marine biology)

Consultant, National Science Foundation, on problems of impact of science or scientific and logistics support activity on Antarctica, 1974-75. Visited Antarctica (McMurdo and South Pole, November 1974)

Consultant, State of Victoria (at Melbourne) on studies of Port Philip and Westernport bays, Nov.-Dec. 1974.

various other consultant activities including with State Water Resources Quality Control Board on San Francisco Bay.

Attended Helgoland Marine Biology Symposium 1972, presented paper on Impact of Impact Studies (publ. Helgol. Wiss. Meeresunters. 1973); Attended Challenger Centenary Symposium, Edinburgh, 1972; paper on De mirabile maris publ. Proc. Royal Soc. Edinburgh, etc.

Attended Helgoland Marine Biology Symposium 1976, delivered paper on Models & Muddles (in press); participated in first annual Symposium on Pycnogonida, Linnean Society, London, October 1976; proceedings in press. Honoured at the dinner as dean of pycnogonodists.

Received Browning Award for Achievement in Preserving the Environment (Smithsonian Inst.,) Oct 1976.

Some recent publications:

One hundred years of Pacific oceanography, in- Biology of the Oceanic Pacific, OSU press, 1974.

The Living Edge. Geoscience and Man, 1975 (a review of intert. research).

In Press: Man on the Seashore: An exponential force against a finite limit in Wildlife in America (CEQ; Govt Printing Office)

Edited ~~xxxi~~ edition of Jerome Tichenor's Poems in Contempt of Progress (Boxwood Press, Pacific Grove 1973, \$2.95)

The Outer Shores: From the papers of Edward F. Ricketts. Mad River Press, current address: Part I. 1978; Part II 1979

5660 Montecito Ave
Santa Rosa Calif. 95404

JOEL W. HEDGPETH

8640 Montecito Avenue, Santa Rosa, California 95404 • Telephone 707-529-1267
ENVIRONMENTAL AND EDITORIAL ANALYSIS

X

January 1 1983

LECTURES AND PERFORMANCES

I. History of marine biology. A short lecture series.

1. Forebodings and beginnings. Aristotle, Oonian and all to J. Vaughan Thomson.
2. Victorians at the seashore and at sea- Forbes, Gosse Huxley & the fisheries, and stirrings on the continent.
3. The rise and change of theories of ecology of the sea. Moebius and the community (especially of oysters); Petersen and food chain models; The Spartina syndrome.

II. 1 The estuarine way of life. (some overlap with I.3). "Dependency", retention and opportunism.

2. San Francisco Bay. A tangled tale of academic negligence, sanitary engineers and water politics. (and some analogous episodes elsewhere).

III Man on the seashore- coastal problems of use, destruction and social activism. ([since the days of Justinian]) Emphasis on the California example.

IV The pycnogonida: an excursion in zoology.

V. Philosophy on the seashore- Ed Ricketts with a dash of Zen.

* * *

The Recycling of Excalibur. The environmental movement as the latest phase of the battle between Roman practicality and the Celtic view of life. The moral of cycling as exemplified by Sir Bedivere's failure to return Arthur's sword to the lake, etc. (Similarities to Indian view of man's place in nature considered when lecturing on reservations)

The Poetry of the Sea. Readings from poetry exemplifying man's interaction with and interpretation of the sea -- an antidote to the Kipling-Masefield school of tall ships and rusty tramps etc.

Update of C V, September 1992;

Joel W. Hedgpeth, Ph D, F.M.L.S.*, FCAS etc

1980 Elected honorary ^{life} member of Estuarine Research Foundation.

1982. Attended International Symposium on Utilization of Coastal Ecosystems at Rio Grande, Brasil, 21-27 November 1982.

1982-83 (uncertain date) listed on EPA honor roll of consultants who never would be missed, categorized as "excellent scientist but complete misanthrope."

June 1983- Attended herring conference at Nanaimo, British Columbia

1983- December, honored by Western Society of Naturalists as Neptune wrestling with giant sea cucumber on their annual program and T-shirts.

1985. Prepared document on Pacific Coast barriers and other coastal features as related to potential dangers to coastal property under contract for U S Fish & Wildlife Service; result had very short press run and distribution was limited. I was given only 15 copies for personal distribution.

1987. Attended IV International History of Oceanography Congress, at Hamburg & Kiel, September.

1987-1990 Participated in evidentiary hearings before the State Water Resources Board in behalf of The Bay Institute of San Francisco.

1990-1992. Involved in testimony and analyses of Sonoma county gravel wars, wastewater controversies, critiques of EIR's etc., writing letters to editors, and numerous book reviews, mostly for *Quarterly Review of Biology*

1991. Elected Foreign Member, Linnean Society of London.

May 1992. Attended and participated as panelist in State Lands Commission on Public Trust and biodiversity in Sacramento.

May 14-17 Participated as invited keynote speaker in a Steinbeck and the Environment conference on Nantucket.

 * Unfortunately I have mislaid the charming letter from the Linnean Society apologizing for inadvertently placing me on the list of the deceased and departed and lamenting that it would be two years before they could get out a revised membership list. I must assure them that I expect to survive that long.

SINCE THE DAYS OF ACADEMY

Commencement address, Fresno State College, June 3, 1970

Joel W. Hedgpeth

There is a strong flavor of good old Methodist ministers in my background, so naturally I must use a text. My text is from Leviticus:

The land shall not be sold forever: for the land is mine; for ye are strangers and sojourners with me. And in all the land of your possession ye shall grant a redemption for the land. (Leviticus 25:23).

If you go out east of here a few miles, where the land begins to rise toward the mountains, you will find a large boulder by the roadside with an inscription that tells you the town of Academy once flourished there. Not far away from there is the cemetery, where, as it says on that boulder, "many of the county's earlier families and their descendants now rest nearby."

Among these are my people: my name is on those stones since Joel seems to be a favorite in our line of Hedgpeths, and my father was born on Dry Creek nearby and my great uncle was pastor of the little Methodist church at Academy.

In the year 1858 my father's people left Missouri for California. They manumitted their slaves, sold their land in Nodaway County, outfitted heavy wagons hauled by teams of six oxen and on the 22nd of April they "crossed the wide Missouri" and struck out across the broad rolling prairies of Kansas. At Albuquerque they turned their wagons ^{west} south, to use for the first time the road surveyed by Lt. Edward F. Beale the year before. This is the route that is now part of Highway 66, so vividly described by John Steinbeck in The Grapes of Wrath. They passed by El Morro, the inscription rock, on July 7, 1858

and left their names upon the rock, along with many others. Disaster befell them on August 17, 1858 when the party was attacked by Indians at the Colorado River. They lost their stock and many of their wagons and they had to go back to Albuquerque to winter over. In 1859, escorted romantically enough by Lt. Beale and his camels, they completed their emigration to California. They were assisted across the Colorado River by Major Armistead, commandant of the newly established Fort Mojave, who became a general in the Confederate Army and died in Pickett's Charge. My people settled first in Visalia and then moved to Dry Creek just after the Academy was established. In those days it was an important settlement, for it was on the main road in the San Joaquin Valley between Los Angeles and Stockton. The road was along the foothills because the lowlands were often impassable in winter. Academy was the big town of the area and had the first high school in this district, which was its pride. The school boasted of its fine building, blackboard, and all that, and especially of its "well selected library of 56 volumes enclosed in a black walnut bookcase." But Academy withered away after the railroad came in 1872 and Fresno became the big town and county seat. Now there is nothing left at Academy but a subdivider who has laid out some lines and is trying to sell "Academy Ranchitos." I am not surprised to hear that they are not selling very well.

Progress passed Academy by, but its ideals for higher education have been abundantly fulfilled here at Fresno State, and some of the descendants of the old pioneers still live around here. Academy, I would think, would be a very suitable place for the headquarters of the society I founded some years ago, called the Society for the Prevention of Progress. But there are not many houses left there suitable for headquarters, unfortunately.

My father's people tried to solve a difficult problem of their times by

selling out and moving west. Of course they were the kind of people that moved west anyhow, and ever since they got to North America they had moved; they moved with Daniel Boone into Missouri. Today quite a few young people will turn their backs on our social problems for a while and join a commune. This is a symbolic group emulation of Thoreau's year at Walden. We cannot all do this even if we wanted to because this kind of use of the land is simply not possible for all of us. There is simply not enough land for this non-exploitive way of life for our population. We are on the horns of a dilemma here. And of course here in the San Joaquin Valley we are in the vast land of agribusiness. An unlovely word, invented by people I am fortunately not acquainted with. This then is the vast world of the railroads and agribusiness. Some of you have read no doubt of the times past as described rather dramatically by Frank Norris in the Octopus, and of course in more recent times by John Steinbeck in his books *In Dubious Battle* and *The Grapes of Wrath*. This idea of agribusiness of course would be foreign to the Old Testament philosophy of my Methodist forebears. But it was on the way even in the 1870's and it was in 1880 that some ranchers were shot down by railroad men at Mussel Slough. It is ironic to remember today that this same octopus receives a substantial federal subsidy for keeping land out of production in the San Joaquin Valley. History has strange quirks.

Frank Norris concluded *The Octopus* with an optimistic paean to the wheat that would always be here in spite of the greed and troubles of men, that would feed the starving of India, yet in his story the survivor of these troubles turns away and goes to sea. We were already in trouble with the land then, as indicated by this story and its ambiguous conclusion. Really, the trouble is our imperfect stewardship of the land. We were in trouble long before Highway 66 became what John Steinbeck called "the mother

road, the road of flight." The trouble really began, if we must fix a date, 201 years ago when James Watt took out the first patent on his steam engine.

Two centuries ago is no time at all, even in human history (as a country we have still six years to go to complete our first 200 years), but we now find ourselves in the dilemma of the Chinese proverb: "he who rides a tiger cannot dismount," yet we must dismount and subdue the tiger. It is remarkable how little of this danger was foreseen by the prophets of progress in the rational, utilitarian age which still influences so much of our political and sociological theory of our world. Despite a sonnet to a polluted stream by Wordsworth:

"Was the intruder nursed

In hideous usages, and rites accursed

That thinned the living and disturbed the dead?"

and such demurrers as Dickens' description of the building of the railroad across the unspoiled countryside of England in *Dombey and Son*, there was little concern for what was happening to the earth. True, George Perkins Marsh as early as 1847 and in his book *Man and Nature* in 1864, when this valley was pastorally naive, warned that the earth was "fast becoming an unfit home for its noblest inhabitant."

Nevertheless men have found it pleasing to listen to the utilitarian sirens who have lured them toward the dangerous rocks of progress - the doctrine of serving the greatest happiness of the greatest number may spring from a philosophy "deficient in imagination" that threw "the mantle of intellect over the natural tendency of men in all ages to deny or disparage all feelings and mental states of which they have no consciousness in themselves" -- so one of them, John Stuart Mill, said of Jeremy Bentham, the patron saint of utilitarianism. He ignored, said Mill, "the whole unanalyzed

experience of the human race." But there is some consolation in all this - men can change their ideas and philosophies and the doctrine of progress is vulnerable: after all, it is an idea, not a fact. As J. B. Bury pointed out 50 years ago (*The Idea of Progress*, 1920), time is the very condition of progress - it is obvious that idea would be valueless if there were "good cause for believing that the earth would be uninhabitable in A.D. 2000 or 2100. The doctrine of progress would lose its meaning and would automatically disappear."

But the utilitarians are still with us, especially the Atomic Energy Commission. They tell us that they know what will be good for us, and that is power generated by atomic energy, and still more power. They seem less concerned for the real future of mankind than they think, or would like us to believe, they are. For the present policy of developing atomic power is "after us the deluge" with a vengeance. Because the high activity wastes generated by these plants--not the mild stuff that leaks out--is laying against the future a terrific deluge. What is going to be done with this stuff? It will not decay for 200 years or more, some of it not for thousands of years.

Of course here in California we are embarked--or at least our politicians are--(it is being fought behind the scenes by lawyers energetically) upon the State Water Plan. Another example of profound anti-ecological ignorance. There has never been an adequate ecological study of this plan or its impact on the environment. Water, to be sure is a problem in California and is needed in this valley, but is more and more of it needed for more and more people? Here is the problem that everyone is preaching loudly. We just can't go on having more and more people.

The choice is looming up: perhaps we should cut off the possibility of

having more and more people. But really this will not be achieved in my opinion until it is the philosophy of everyone that too many people are undesirable.

Mary Austin had a very unfortunate experience in the Owens Valley and she said the diversion of water to Los Angeles and the destruction of that valley would bring retribution, that the earth would speak out. She was a pretty good prophet, but she couldn't have predicted the way it has happened: the pine trees are dying and people are advised to leave Los Angeles at the rate of 10,000 a year. This is the sort of thing we are making possible with this kind of activity.

Of course we cannot go back to the good old days of Academy, we are going to have to look forward to the bad new days. Not long ago we had a national day of observance for the earth. A day of ecological awareness. Many things were said about the peril that confronts us and what we must do. I was among those who like my staunch Methodist forebears, took to the circuit and preached the gospel. We did not expect, and still do not expect, the world to be redeemed overnight, or men to change their ideas immediately. The moral of Earth Day was that we were concerned for the future, and that we were asking ourselves why we are on this earth at all. We cannot expect to solve this problem of our survival by magic or by words alone, especially when we are not sure just what the minimum environment for the continued life of *Homo sapiens* is on earth, to say nothing of what the optimum environment might be.

So we need everyone's help and we hope that Earth Day started some people at least on a lifelong commitment for these bad new times that are coming up. Of course some of us are still basically optimistic and we hope things won't be quite that bad. We have some Jeremiahs in our midst who

are saying things a little too extremely so they have no way to back off. We could be wrong in some degree but not in the basic predictions, because these are based on the carrying capacity of the earth.

But only a few weeks after the euphoria of Earth Day we see in the papers that our politicians and economist are getting worried about the costs of cleaning up the environment. This would cut into the economic structure, we might lose jobs and this would cut down industry so we'd better keep on going the way we have. It's not easy for mankind to understand that he like the individual can die. We all know we must die so we put the thought aside. For the whole species, the whole society, to realize that there are certain things we must do, is very difficult. So the obvious thing from the reactions of some politicians is that the real issue is not pollution or the cost of cleaning it up, but the desirability or the undesirability of our present social and economic structure, that is so destructive to the environment. Time is simply running out on progress.

Now a lot of words have been said about how we can get all we need from the sea once we have exhausted the land, that the resources of the sea are inexhaustible and there will always be fish in the sea. But we are terrestrial beings and the land will always be our chief resource. At this time we get about 2 or 3 per cent of the world's protein needs from the sea, represented by a fisheries catch of perhaps 60 million metric tons. To keep up with the population explosion we should count on ten times this or 600 million metric tons by the next 50 years, but this is beyond the limit the sea can yield and we might get at most about half or a fourth, or 250 to 300 million metric tons. The reason for this is that people have been confused about the total volume of the oceans and the parts that are usable. To be sure, there is some sort of life nearly everywhere in the ocean, but it's

pretty thin and the activity goes on in the narrow coastal areas and the comparatively shallow areas near the surface. But these are the areas we treat most thoughtlessly. That we overfish and that we pollute by dumping things in at the shore or by fallout from the air. And fallout doesn't necessarily mean radioactive materials. Detergents, pesticides and other things when applied may go up in aerosols and be transferred into the atmosphere so that they are carried even to the Antarctic regions where they are concentrated in penguins and Antarctic seals for example. Indeed we will have to be even more careful about what we do on the land to save what we can of the resources of the sea.

In ten years--so I have heard somewhere--something like less than half of you will be doing what you planned or studied to do in the last four years. I hope that percentage is even less as far as Indo China or any other remote part of the world is concerned. At the same time I hope an even greater proportion of you than now committed will be in the environmental ranks.

You will be needed--you are now--to protect this valley from becoming another Los Angeles slum, for even out into the hills are these people who would subdivide all the hills in Tulare County in a mad urge to make money, who boast of the state's largest subdivision near Visalia, and send their agents out to buy off university critics and three times their university salaries. Would you like to be a tame ecologist for Boise Cascade? Everyone concerned for the future of this valley should examine this scheme and seek to change the policies of this company--by direct action, appearances at hearings, as stockholders, or whatever you may happen to be, for if ever there was an organization that deserved the scorn of Isaiah, this is it:

Woe unto them that join house to house, that lay field to field, till there be no place that they may be placed alone in the midst of the earth! (5:8).

I noticed in the Fresno Bee this afternoon that Supervisor John Krebs said Fresno County planning commission members should have the decency to resign if they cannot attend meetings. I hope that if any of you rise to such lofty positions as members of planning commissions you will go to the meetings. This kind of direct personal action must be the part of every one of us to protect what we can of the environment.

What happened to all the beards? Are they outside picketing us? I don't object to whether you come with a full beard or come stark naked like the ancient Celts went into battle, but I would only ask that those of you who take up the arms of words please use them with reasonable coherence and consistency. Nothing wearies the patience of the people in governmental boards and hearing commissions and the like as much as aimless, unprepared harangues that consume a great deal of time and never get ^{any} ~~nowhere~~.

But the lawyers, the merchants and the chiefs and everyone else will be needed. Especially the lawyers, and I think this is the principal direction we must go in changing our laws, getting better substance, environmental awareness, into our legal system. Surprising, for instance I have been involved in fights about beaches and water rights, and from the viewpoint of the ecologist our legal structure is very strange and nonsensical. The good judges who decide what a beach really is do not seem to know what the tide is and you can't understand the nature of the beach without understanding the tide. We have a great deal to learn because of our delusion with the god of progress and our belief that we are the chosen of this earth.

And so, we hope to see you in the ranks, the ranks of thoughtful action, not of Quantrell's raiders or burners of computers. I too have a distrust of our modern technology and I am convinced that our salvation does not lie with our machines, but I think we will need the help of some of these gadgets, because we must work out a whole new system. The environmental cause does not need and does not want martyrs in the streets and on the campuses nor soldiers fallen on battlefields--it is a cause for living, for people and their survivors. Of course we assume, those of us who are called environmentalist, that man's tenancy of the earth is worth prolonging and that it is best for ourselves now living and for our descendants to avoid the terrible consequences of exceeding the carrying capacity of the earth. We are asking of all men that we do not forget that we are strangers and sojourners on this land.

INDEX--Joel Hedgpeth

Alexander, Josephine, 174
 Antarctic Medal, 222
 Antarctica research program, 76-77, 207-222
 Hedgpeth Heights, 222
 Hero research vessel, 210-211
 Lindblad tour, 213-215
 report of scientific activity's effect on the environment, 216-220
 studying pycnogonids, 208
 Aquatic Habitat Institute, 267
 Army Corps of Engineers, United States
 American River proposal, 114
 Bodega Head project, 192-193
 San Francisco Bay model, 256
 Arnett, Ray, 183
 Astro, Richard, 108-109, 227-228
 Axelrod, Dan, 88
 Azov, Sea of, 236-237, 248-249

 Barnes, Grant, 110, 118
 Bay Institute of San Francisco, 247, 268
 Berolzheimer, Charles, 158-159
 Bertrand, Jerry, 219
Between Pacific Tides, 92, 93, 95, 97-98, 104-106, 108, 110, 122-123
 Bigelow, Michael, 18
 Bodega Bay proposed nuclear power plant, 171, 173-191, 193
 University of California's role, 181-186
 Bodega Head, 192-193
 Bolin, Ralph, 120
 Briley, DeWitt, 61-62
 Brower, Anne Hus, 9-10, 234
 Brower, David, 233-234
 Browning Award, 274-275
 Bureau of Reclamation, United States, 45, 246, 249
 Burt, Wayne, 196-199, 202
 Buzzatti-Traverso, 146
 Byrne, John, 117, 198

 Caen, Herb, 189
 California Department of Fish and Game, 232, 241, 270
 Calvin, Jack, 105-107
 Campbell, Joseph, 106, 108-109, 111, 124-125, 228
 Caspers, Hubert, 143-144, 236
 Child, Al, 120, 130
 Clegg, James, 186
 Collier, Albert, 235, 253
 Cone, Donald, 175
 Constance, Lincoln, 87-88
 copepods, 79
 Creagh, Agnes, 146-147
 Curtis, Garniss, 272

 Daniel, J. Frank, 65-66
 Dasmann, Ray, 116-117, 184
 Davoren, William T., 247
 Dayton, Paul, 212
 Denton, Richard, 251
 Dillon Beach, 150, 157-160. See also Pacific Marine Station
 Dunning, Harrison, 246

 ecological concepts, 90-92, 96, 101-102, 123
 Environmental Defense Fund, 247
 environmental impact reports, 242
 Environmental Protection Agency, 241, 267
 environmentalists vs. agribusiness, 74, 244-247, 264, 270
 estuarine studies
 in Russia, 236-237, 249-251.
 in Texas, 235-236, 252-253
See also San Francisco Bay-Delta environmental issues

 Fahrenbach, Henner, 208
 Fellows Medal of the California Academy of Science, 274-275
 Fish and Wildlife Service, United States, 247
 Fischer, Hugo, 254-256

Fisher, Walter K., 123
 Flower, Enola, 47-48
 Flynn, Errol, 18, 211-212
 Fox, J. Phyllis, 251, 257-261
 Frederick, Aaron, 42-43
 Freeborn, Stanley, 72
 Fry, Bill, 129, 204-207, 213
 Furneaux, Hugh, 37-38

Gaffney, Rose, 191-192
 Gause's Principal (competitive exclusion), 122-123, 124-125
 Gifford, Edward W., 66-67
 Gilbert, Grove Karl, 238-239, 254
 Giles, George, 132
 Gilliam, Harold, 191
 Gleason, Walter, 238, 264-265
 Grendon, Alexander, 178-179
 Grinnell, Joseph, 78-79, 101-102, 164
 Gunter, Gordon, 74, 80, 115, 132-134, 144, 145, 152, 235

Hamby, Bob, 180
 Hand, Cadet, 163, 181, 184-186
 Hart, James, 18
 Hatfield, Mark, 198
 Hedgpeth Heights, Antarctica, 222
 Hedgpeth, Florence Warrens (wife), 79, 151
 Hedgpeth, Joel (father), 1-2, 10-15, 32-36, 42-44, 48-49, 52, 58
 Hedgpeth, Joel Walker, other family, 2-6, 8-9, 11, 16-17, 19-21, 23, 27, 32, 50, 54, 59, 83, 161-162. See also McGraw, Edward Walker; McGraw family aunts
 Hedgpeth, Sarah Ellen (Mrs. Paul Boly) (daughter), 151, 200
 Hedgpeth, Sarah Ellen (Nellie) Tichenor McGraw (mother), 1-22, 25, 34-36, 41, 43, 47, 52-53, 56-60, 69, 127
 Hedgpeth, Warren Joel (son), 28-29, 151
 Hemphill, Henry, 23, 72-73, 83, 102-103

Hilton, William A., 120-121
 Homes, Geoffrey, 18. See also Mainwaring, Dan
 Horne, Alec, 266-267
 Hosmer, Jennie (Bee), 23
 Hubbs, Carl, 148, 149, 150, 211

Jinglebollix, 120-121
 Johnson, Ralph Gordon, 166-169

KPFA radio station, 178-181
 Kashevarov, Father, 106
 Kashevarov, Xenia, 106-107
 Keen, Myra, 84
 Keep, Josiah, 83
 Kortum, Bill, 188
 Kortum, Karl, 167, 187-188, 203
 Kozloff, Gene, 105
 Krone, Ray, 251

Ladd, Harry, 133-134
 Leopold, Aldo, 115-116
 Leopold, Luna, 115-116, 182
 Leopold, Starker, 182-184
 Lidicker, William, 240-241, 271
 Light, Sol Felty, 70, 72, 77-79, 88, 91, 93, 99, 102, 157
 Littleworth, Arthur, 264-265
 Llano, George, 216-217, 222
 Loosanoff, Victor, 170, 261
 Lovejoy, Ritchie, 106-107
 Lund, E.J., 80, 81, 151-153

Mainwaring, Constance, 17, 93, 94
 Mainwaring, Dan, 18-19, 108-109
 McGraw family, aunts of Joel Hedgpeth, 2-6, 16-20, 27, 32
 McGraw, Edward Walker (grandfather), 2-7, 19-25, 27, 31-32, 42, 49, 62, 69
 Marine Science Center, Oregon State University, 196-203, 225, 228
 Mertes, David, 167-168, 202
 Meyer, Amy, 38-39
 Meyers, Samuel, 171
 Miller, Alden, 70-71
 Moss Beach, 157

Murphy, Al, 102-103
 Murphy, Dennis, 23, 99
 Myers, George S., 239-240

Needham, Paul, 182
 Neilands, Joe, 189-191
 Nichols, Fred, 241
 Noble, Alden, 156-158, 160, 166, 171

Office of Naval Intelligence, United States, 137-141

Oregon State University, 196-203, 224-230

Outer Shores, *The*, 94, 98, 109-110

Pacific Gas and Electric Company [PG&E], proposed nuclear power plant, 173-191, 193

Pacific Marine Station, Dillon Beach, 159-163, 166-171, 194, 204-206, 229

Painter, Theophilus, 79

paleoecology, 119, 133, 167

Papenfuss, George, 161, 181

Peltier, Jason, 245

Pesonen, David, 44, 183, 188

Pesonen, Everett, 44-45, 188

Peterson, Carl G.J., 91

Port Aransas, 80, 151-152. See also University of Texas.

Prichard, Don, 232, 255, 270

pycnogonids
 characteristics of, 76, 85, 128, 130, 208-209
 interest in, 73, 75, 85-86, 127, 130, 170
 studies of, 75-76, 102, 115, 129-131, 204-205, 211-213

Racanelli, John A., 243-244

Reber plan for San Francisco Bay, 256

research and publications, Joel Hedgpeth, 73-76, 79-80, 90-93, 96-99, 102, 104-106, 109-120, 122, 127, 129-130, 133, 179-180, 204-205, 207-210, 212-213, 216-

220, 231, 235-236, 244-247, 252-253, 256

Revelle, Roger, 133, 135, 142-143, 145-149, 172

Reynolds, Malvina, 180-181

Ricketts, Ed, 92-97, 99, 104-111, 113, 120-125, 129, 157, 227-229

Robilliard, Gordon, 219

Rowland, Ed, 50

Russian scientists, 137-141, 170, 173, 221, 236, 250

Salmon preservation studies, 73-74, 114, 244-246

Sampson, Arthur W., 64

San Francisco Bay, oyster distribution in S.F. Bay and Delta, 232, 260-261
 scientific research on, 238-243
 striped bass population, 262-264
 tidal hydrography, 255-256
 tule hypothesis, 257-260

San Francisco Bay-Delta environmental issues, 231-273 *passim*

Sauer, Carl, 82

Schmitt, Karl Patterson, 143

Schmitt, Waldo, 71, 73, 129

Schopf, Thomas, 166, 169

Schramm, Fred, 130

scientists and public policy, 265-268

Scott, Tom, 198-199

Scripps Institution of Oceanography, 119-120, 135, 142-143, 145-147, 150, 172-173, 231

sea spiders. See pycnogonids

Shasta Dam environmental impact studies, 73-74, 114

Shubel report on S.F. Bay environmental problems, 270

Singer, Charles, 70

Sloan, Doris, 270-272

Smith, Felix, 247-248

Smith, Ralph, 164-165

Society for the Prevention of Progress, 113-117

Stanford University, 110, 240

Stanford University Press, 110, 125

Steinbeck, Carol, 94-95, 228

Steinbeck, John, 18, 94-95, 104, 106-110, 112, 227-228

"Steinbeck and the Sea" conference, 108-110, 112

Steinberg, Joan, 163, 165

Stephenson, T.A., 131

Stewart, George, 67-68

Stock, Jan, 129-130

Sutton, Jim, 261

Texas Game Fish and Oyster Commission, 74, 80, 94, 115, 151, 235, 252-253

Thorson, Gunnar, 91

Tolmazin, David, 250

Tomales Bay, 169-170

Treatise on Marine Ecology and Paleoecology, 131-137, 141-149, 165, 236

Trinity River, 246

United States Bureau of Reclamation, 246, 248

United States Fish and Wildlife Service, 248

United States Geological Survey, 133, 238-239, 241

United States Office of Naval Intelligence, 137-141

University of California, Berkeley evaluation of students and faculty, 65-68, 70-72, 77-79, 82, 87-88, 102, 181-186, 240, 266-267, 270-272 marine studies, 157, 163, 240, 255, 270-272

University of Pacific, 149, 157, 161-162, 170-171, 176, 193-194, 196, 204-206

University of Texas, 80-82, 151-154

Vaughan, Thomas Wayland, 133-134

Warren, Earl, 44

water issues and studies
See environmentalists vs. agribusiness, San Francisco Bay-Delta environmental issues, Shasta Dam environmental impact studies

Windscale, England, nuclear incident, 174, 176-177

Wohlschlag, Curly, 269-270

Wood, Charles Erskine Scott, 233

Wright, Sir Charles, 220-221

Yaquina Biological Laboratory, 196-203, 225. See also Marine Science Center, Oregon State University

Zenkevitch, L.A., 137, 236

ANN LAGE

B.A., and M.A., in History, University of California, Berkeley.

Postgraduate studies, University of California, Berkeley, American history and education.

Chairman, Sierra Club History Committee, 1978-1986; oral history coordinator, 1974-present; Chairman, Sierra Club Library Committee, 1993-present.

Interviewer/Editor, Regional Oral History Office, in the fields of natural resources and the environment, university history, California political history, 1976-present.

Principal Editor, assistant office head, Regional Oral History Office, 1994-present.

104375

